Carlsson, S.
Tuberculosis in Sweden.

·1908·

THE STRUGGLE AGAINS
TUBERCULOSI
IN
SWEDEN

A PUBLICATION DEDICATED TO THE
INTERNATIONAL TUBERCULOSIS CONGRES
IN WASHINGTON

THE STRUGGLE AGAINST TUBERCULOSIS IN SWEDEN

· 1908 ·

EDITED BY

STURE CARLSSON, M. D.

CENTRALTRYCKERIET, STOCKHOLM 1908

THIS PUBLICATION IS DEDICATED TO THE

INTERNATIONAL TUBERCULOSIS CONGRES TO BE HELD AT WASHINGTON 1908

BY

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ISSUED BY THE SWEDISH GOVERNMENT.

THE SWEDISH NATIONAL ANTI-TUBERCULOSIS ASSOCIATION.

BY

B. BUHRE, M. D.

SECRETARY OF THE ASSOCIATION.

A SYSTEMATIC fight against tuberculosis in Sweden may said to have begun in the year 1896, when the *Swedish Medic Society* discussed the question most thoroughly and subsequent devised several measures against the disease, which in this, as other civilized countries, has become so widely spread.

One of these proposals consisted of arranging a prize competiti for the best popular pamphlet on tuberculosis. Through the insti mentality of the government such a competition was immediate arranged and the result was three short and exceptionally we written popular little books on consumption. These were print in large editions at the expense of public means and were dist buted by the authorities gratis to municipalities, schoo lecturing societies, hospitals, dispensaries and surgeries etc. and we also to be had from booksellers at a moderate price.

On the afore-mentioned occasion the Swedish Medical Society h also pointed out the necessity of establishing public sanatoria soon as possible. At first, the attainment of this object seemed be in the far and distant future. Soon, however, it was seen th the idea had won much sympathy within all classes of society, a in the following year, 1897, when our late and much beloved Kin *Oscar II*, celebrated his twenty five years jubilee as Sovereign, t supporters of the tuberculosis movement were surprised by the gl

news that the King had magnanimously devoted the proceeds of the national collection, which had been set on foot to commemorate the event, for the erection of public sanatoria. The sum donated amounted to about 2,200,000 kronor (= about 583,400 $).

In a special article* Dr. Wadstein gives a detailed account of the erection and further development of the King Oscar's jubilee sanatoria, Hessleby, Hålahult, and Österåsen.

KING GUSTAF V.

THE ORIGIN OF THE NATIONAL ASSOCIATION.

With the establishment of our three excellent and up to date public sanatoria, and the publication of pamphlets on consumption was certainly a great step taken in the fight against tuberculosis, but still, much yet remained to be done. It became evident that the tuberculosis question, of such great importance to the whole country, needed a central organisation which

* Page 92.

could act as pioneer in investigating the question from all points o: view and take the lead in the systematic work against the disease

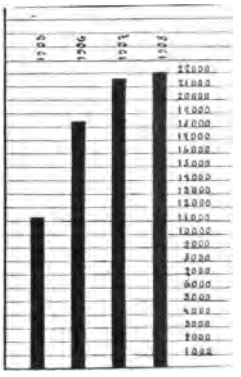
Seeing this the other great medical organisation of this country called "*The Swedish General Medical Association*", took the initiativ in the foundation of a central association fo the prevention of tuberculosis embracing th whole country.

BARON TAMM
President of The Swedish National Anti-Tuberculosis Association.

An appeal to the public was issued, signe not only by representatives of the medica societies but also by *King Gustaf V*, the Crown Prince of Sweden, and a great num ber of men and women occupying notabl positions in the country.

On the 28 February 1904 the Swedis National Anti-tuberculosis Association* wa founded under the patronage of Crow Prince Gustaf. As president was elected one o the most prominent men of the country *Baron Gustaf Tamm*, late Chancellor of the Exchequer, late Governor-general of the City of Stockholm, and member of the Upper Cham ber of the Parliament.

S. T. A's MEMBERSHIP. The number of S. T. A's members was right from the commencement rather great and has increased from year to year as will be observed from the following graphic account.



Increase of membershi of the Swedish Nationa Antituberculosis Associa tion 1904—1908.

If one takes into consideration the fact that Sweden does not possess more than about 5,300,000 inhabitants, and that in many parts of the country, especially in the north, the density of the population is exceptionally small, the result may be regarded as comparatively very good.** It is true that just now, the association's growth seems to be at a standstill, but this is probably only of a temporary nature. As soon as the agitation for the tuberculosis movement finds time to work in parts of th

* Hereafter called S. T. A.

** 1 member to 241 inhabitants = 4,16 ‰

country not so easily won, and branch associations of the S. T. A. are established, the number of members is sure to increase again.

The professions or trades of the members are indicated on the following list.

1)	Workmen in Iron Works and Saw Mills	3,086
2)	Artisans and Dealers	2,371
3)	Estate-owners, Farmers, Farm labourers	2,103
4)	Doctors, Dentists, Veterinary Surgeons, Chemists, Nurses' Hospital officials, Instructors in Gymnastics	1,712
5)	Bankers, Bank clerks, Merchants and their Clerks	1,512
6)	Factory hands	1,396
7)	State officials, Judges, Barristers	1,354
8)	Factory owners and their clerks	1,049
9)	The Chiefs and clerks of the Railways, the Postal, Telegraph, Telephone services besides other communication departments	976
10)	Teachers	929
11)	Military men	601
12)	Proprietors of Iron Works and Saw Mills and their clerks	515
13)	Clergymen, Church officials	499
14)	Printers hands	269
15)	Authors, Artists, Students	189
16)	Insurance Comp. officials	178
17)	Journalists, Clerks in printing offices	173
18)	Servants	120
19)	Brokers, Captains, and Seamen	84
20)	Innkeepers	77
21)	Persons without stated occupation (chiefly ladies)	2,864
		22,057

THE ORGANISATION OF S. T. A.

The principal seat of the S. T. A. is at Stockholm. Its business is managed by a Central Board, consisting of 12 members from different parts of the country and representing different social classes. The principal work is performed by an executive committee at Stockholm where the office of the Association is also located. It has a permanent staff of 5 or 6 assistants, excluding the officials of the association.

Under the central organisation local branches are formed eac of which comprises either a whole county or one of the greate provincial towns. They have their own boards, and are compara tively independent of the central body.

The subscription fee for members is either 100 kronor (= abou 26: 52 $) once for all or 2 kronor (= about 0: 53 $) a yea Workmen and other less well-off persons may join the associatio however, for a lower charge. In that case their number must be a least 50, who all send in their names for admission at the sam time and agree to collect the fees without any expense to the S. T. A and distribute the literature that is sent out from time to tim to all the members of the association.

The branch associations have the right to dispose of three quarter of the annual fees they collect; the rest is sent to the S. T. A.

Local committees attend to the interests of the S. T. A. i those parts of the country where no independent branc associations have been founded. The central association as wel as the branch ones have also chosen persons, who are interested in the movement, to be their representatives at places where local committees are not considered necessary. Those persons assis in collecting of the subscriptions, the acquiring of informations, th arranging of lectures and meetings etc.

Since the year 1908 the S. T. A. has belonged to the Internationa Anti-Tuberculosis Association.

THE ECONOMY OF S. T. A.

To meet the expenses for the rather extensive work carried on by the association considerable pecuni ary means are required. Members' subscriptions and incidental gift have naturally not been sufficient.

During the years 1904—1907, these have amounted to the follow ing sums:

	FEES.	GIFTS.	SUM.
1904	57,499: 95 kronor	54,863: — kronor	112,362: 95 kronor = about 29,804 $
1905	31,428: 40 „	23,293: 24 „	54,721: 64 „ = „ 14,515 $
1906	30,853: 89 „	8,305: 99 „	39,159: 88 „ = „ 10,387 $
1907	28,121: 40 „	5,634: 29 „	33,755: 69 „ = „ 8,954 $
	147,903: 64 kronor	92,096: 52 kronor	240,000: 16 kronor = about 53,360 $

This does not include an annual donation of 12,000 kronor that has been given since 1906, by a private company, for a special purpose, an account of which will be found in the following.

CHARITY-STAMPS. The chief source of income, however, has been the selling of so-called charity-stamps, which has yielded a clear profit of about 228,000 kronor (= about 60,477 $) during the years 1905—1907.

It would certainly have been extremely difficult to keep up the financial balance of the S. T. A. without this contribution, all the more so as one of the chief principles in the management of S. T. A. is, that its economy shall be based upon voluntary gifts only, without the support of public means.

Mr *T. Gelhaar*, Post-office Controller, gives in another part of this book* an account of the origin of the charity-stamps and the manner in which they have been used in the service of the S. T. A.

THE PROGRAMME OF THE S. T. A. According to the Programme,** adopted for the work of the S. T. A., the aim of the association is this: *to fight in every way possible against tuberculosis as a widely spread disease in our country.*

The S. T. A. tries to carry out this programme chiefly by spreading a knowledge of tuberculosis, by arranging statistical enquiries as to its occurrence and its spread and by collecting and propounding new experiences concerning the disease that have been gathered at home or abroad and which can be made useful to our own needs. The association also keeps up a strenuous agitation for the erection of sanatoria, tuberculosis-hospitals and other establishments for the care of those attacked by the disease and for the prevention of the spreading of the infection.

On the other hand, it is not the duty of the S. T. A. to bear the expenses of medical attendance of any kind, nor to build sanatoria or hospitals. Still the association is at liberty to found establishments as an experiment in order to try new methods or to show the way to those authorities in the country on whom, according

* Page 80. ** Page 68.

to our view, the duty devolves of attending to the public care of the sick, namely County Councils and Parish Councils.

From this it may be seen that the chief object of the S. T. A. is an agitatory and pedagogical one, besides which the association has to manage the strategy of the fight against tuberculosis in the country. Its philanthropical purpose is, as will be seen, of a secondary nature.

Past years have shown that this restriction of the work, made from the beginning, was well-advised. In this way the interest has become more concentrated and the initiatives richer than would have been the case, if the association had also been responsible for the administration of medical establishments.

It would, however, not have been possible to entirely leave out the direct connection with sanatorial and other medical work from the programme of the S. T. A., had not an institution existed in the country, before the foundation of the S. T. A., representing that side of the work, viz. King Oscar II's Jubilee Fund.

The Jubilee Fund and the S. T. A., though independent, have in this way completed each other, and there has never been any difficulty in bringing about cooperation when united work has been necessary.

SPREADING INFORMATION TO THE PUBLIC.

LECTURES ON TUBERCULOSIS. Immediately after the start of the S. T. A., the Board of management set to work to arrange lectures in different parts of the country. A number of young physicians were requested to be at the disposal of the S. T. A. for this purpose.

A collection of lantern-slides and other material illustrating the tuberculosis-question were procured, and some lectures were held in Stockholm by the leaders of the S. T. A. The lecturers elected to travel were requested to attend those lectures in order to get a basis on which to work.

An instruction was issued to the lecturers. An extract of which runs as follows:

"The lecturer should render an exact and popular account of such parts of the tuberculosis-question as he may think appropriate,

work for the increase of membership of the S. T. A., and therefore also mention the measures, taken or planned by this association. He should urge to fight against the disease and plead for the erection of hospitals for consumptives. As to the danger of infection, this should be pointed out but not exaggerated. It ought to be made clear that the real danger consists in a long-continued daily intercourse with consumptive persons in an infectious stage, but that the danger is decreased in the same proportion as the expectorations of the sick are rendered innocuous, and cleanliness is observed. The susceptibility of children for the infection should also be pointed out.

Political opinions and other social questions, which have no immediate relation to the subject, must not be touched upon in the lecture.»

The lecturers have free journeys, an allowance of 10 kronor (= about 2.65 $) per day and a fee of 25 kronor (= about 6.63 $) for each lecture.

Through the negotiation of the delegates and the different branches of the S. T. A., the lectures have been going on almost without interruption, and nearly all parts of the country have been visited.

The local press is informed in advance from the office of the S. T. A. of the lecturer's visit, and is asked to review the lecture exhaustively, a request that has been granted almost without exception.

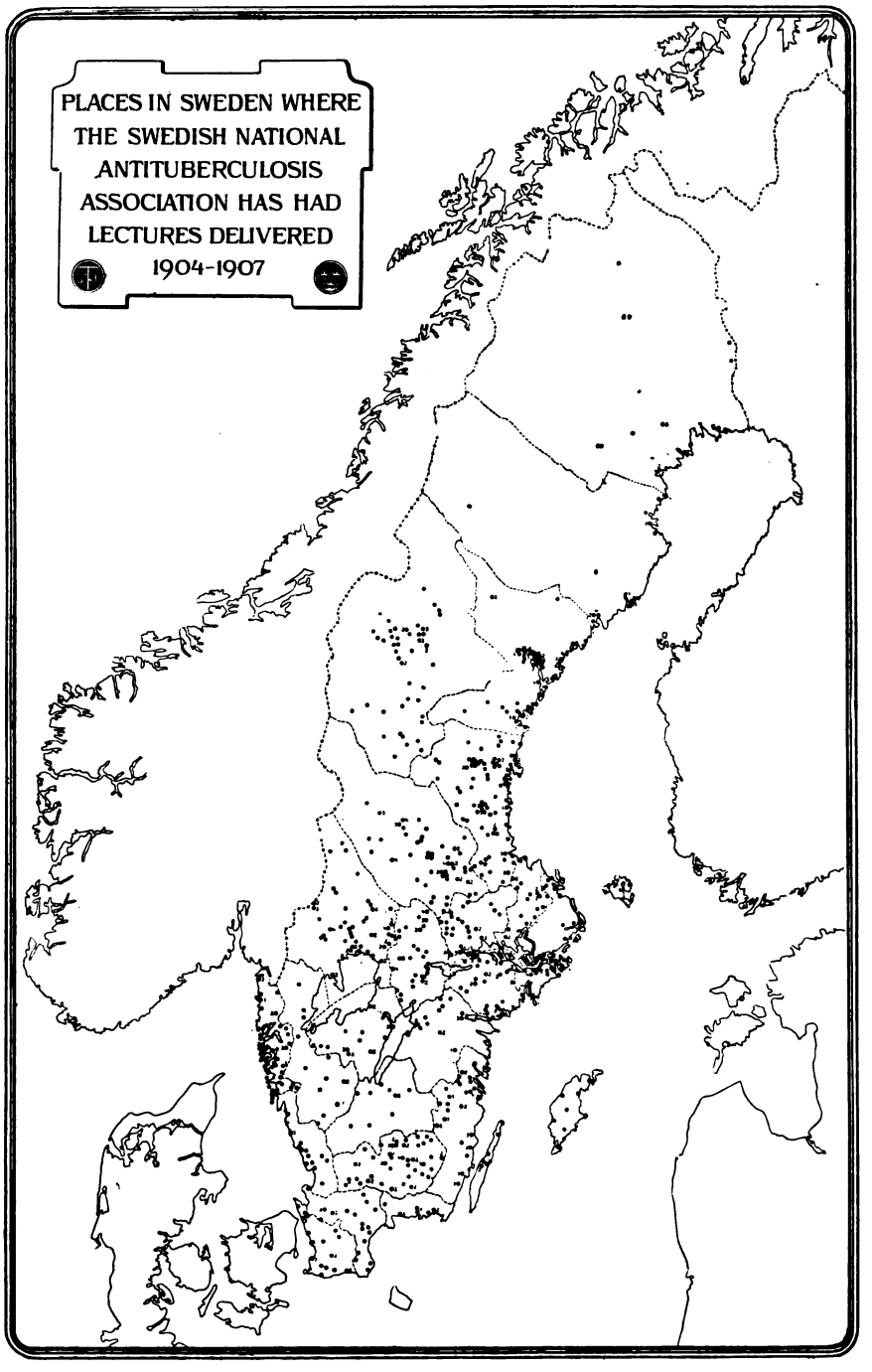
In this way 883 lectures, most of them illustrated by lantern-slides have been held by 38 doctors during the years 1904—1907. They have been attended by about 147,600 persons. A copy of the *Statement* to be found in another part of this book* has been distributed to every person attending.

The extent of the lecturing-work is made clear by the map on the next page.

THE TUBERCULOSIS-MUSEUM AT STOCKHOLM.

In Stockholm knowledge of tuberculosis has been spread chiefly by means of the tuberculosis-museum, founded there by the S. T. A. It consists of large premises, situated in one of the busiest streets. It contains instructive pathological and anatomical specimens, statistical tables and maps, sanatorium accessories, models, literature and so on. The public has free admission 3 days each week, when a short lecture

* Page 70.


PLACES IN SWEDEN WHERE
THE SWEDISH NATIONAL
ANTITUBERCULOSIS
ASSOCIATION HAS HAD
LECTURES DELIVERED
1904-1907

is held by a physician appointed by the S. T. A. More than 41,000 persons have attended these lectures since the museum was opened in April 1906.

PAMPHLETS ON TUBERCULOSIS.

It is evident that the spoken word, when the question is to inform the public, has the greatest effect, but on the one hand only a small number of persons can be reached in this way, and, on the other hand, certain parts of the tuberculosis-question are easier to write of than to speak about.

The tuberculosis-Museum in Stockholm.

The S. T. A., therefore, has tried to carry on the work of enlightenment by distributing great numbers of popular pamphlets, short notices and communications on tuberculosis.

The following pamphlets have been distributed to all the members of the association, to societies for the education of the people, schools, magazines, newspapers etc.

On tuberculosis from a Medical point of view, by Professor J. G. Edgren (20,000 copies).

Tuberculosis from a social point of view, by Sven Palme (20,000 copies).

The significance to the sick and the healthy of the struggle against tuberculosis, by Per Hallström (20,000 copies).

Sanatorium treatment at home, by Dr. John Tillman* (25,000 copies).

Tuberculosis and its subdual, by Dr. Ivan Bratt (25,000 copies).

The Conqueror of the Destroyer, by Mr. Harald Östenson (25,000 copies).

Advice to consumptives and their surroundings as regards precautions to be taken at home (25,000 copies)**.

Advice to lung-patients waiting for admission to a sanatorium by Dr. J. Tillman, Dr. Emil Wadstein and Dr. C. E. Waller*** (25,000 copies).

* Page 53. ** Page 72. *** Page 74.

All the young men of the country, when presenting themselves for military service, receive at the preliminary mustering a pamphlet published by the S. T. A. in an edition of 100,000 copies and containing a short account of the most important points of the tuberculosis-question.

Our prominent popular medical writer, Dr. *Israel Holmgren,* has at the request of the S. T. A. written a book on tuberculosis for the instruction of the higher classes in the primary-schools. Fifteen thousand copies have been printed and distributed free of cost to all primary-school masters in the country. The book appeared at the end of 1907 and is already used in several seminaries and schools.

THE QUARTERLY PUBLICATION OF THE S. T. A.

Since 1906 a publication issued by the S. T. A. has appeared 4 times a year. It is edited by Dr. *Sture Carlson* and is meant to form a bond of union between those who are interested in the tuberculosis-movement. In the publication are inserted first and foremost the articles to which prizes have been awarded at the competitions, arranged by the S. T. A., and in addition other interesting articles on tuberculosis, on account of the fight as it is going on at home and abroad, notices, advices, correspondents' articles, etc.

It is printed in an edition of 25,000 copies and is sent to the members of the association postage free.

A firm for the distribution of literature sees that all that has been published by S. T. A. is kept on sale by booksellers in the country.

THE CONSUMPTION TERROR.

The work of enlightenment, carried on in the way mentioned above, has unfortunately in many places called forth as a side issue, a widely-spread nervous fear of the disease. It is true that the lecturers are requested to work against it as energeticaly as possible, and that time after time a battle is taken up in the S. T. A's organ against this unreasonable terror, but still it keeps on.

The S. T. A., therefore, has recently resolved to publish a special polemical pamphlet, »*The consumption terror*», against this stiff-necked

enemy to methodical work against the diseace. This pamphlet, which will be found farther on,* is to be distributed in 250,000 copies all over the country.

THE S. T. A. AND THE PRESS. The S. T. A. has received most valuable support from the Press, which has shown the warmest interest in the work of the Association. Several hundred lengthy articles, in addition to shorter ones and to brief notices of various kinds about the Association, which have appeared in the greater number of the Swedish journals, have kept the puplic in touch with the labours and leading principles of the S. T. A. A collection of several thousand newspaper cuttings, preserved at the office of the Association, bears witness to the good-will towards us exhibited by the swedish Press.

THE TRAINING OF PHYSICIANS AND NURSES AT SANATORIA.

The success of the fight against tuberculosis must always to a large extent depend on the interest bestowed upon the matter by the physicians and on the diffusion amongst medical man of an intimate knowledge of the diagnosis, prophylaxis and hygiene of tuberculosis. In the same degree that the general interest in tuberculosis increases, and more hospitals and sanatoria are established, specially trained physicians will be more and more in demand.

It has therefore seemed necessary to the S. T. A. to care for the steady increase of the number of medical men, well acquainted with this branch of medicine. The S. T. A., therefore, has entered into an agreement with the General Council of the public sanatoria of the jubilee fund, that physicians chosen by the S. T. A. shall be admitted to a course of 2 months at one of the sanatoria. For this purpose the S. T. A. annually awards 6 scholarships to physicians who send in their names in order to gain this advantage.

Since the year 1908, hospital-nurses are trained in the same way.

THE ESTABLISHMENT OF SANATORIA AND HOSPITALS FOR CONSUMPTIVES.

When the S. T. A. began its work in 1904, there was no interest as to the care and treatment of those attacked by tuberculosis

* Page 76.

to be found, some medical circles excepted. After the erection o our 3 large public sanatoria at the end of the 19th century, peopl almost seemed to consider that everything had been done, tha was necessary. Hardly one community or any other authority ha a thought of building a sanatorium or a home for consump tives. The sanatoria already existing were overcrowded, and man thousands of consumptives could not have their desire fulfille to obtain medical care at a sanatorium. If the fight was to b successful, the question of sufficient establishments had first of all t be solved, so that at least the majority of the consumptives could b received at a sanatorium or some other suitable place.

It was not difficult for the S. T. A. to see the path of duty. Publi opinion had to be aroused and an agitation to be started in favou of a reformed system of taking care of the diseased. Projects ha to be worked out for the supply of this need in a practical wa corresponding to the economical position of the country.

The lecturers, travelling about in the country, were told to work for the purpose. They urged the adoption of measures for the erection of suitable establishments, and pointed out the dangers, which threatened through the want of places where infectious cases could be isolated. Through the aid of the Press this was further discussed and the matter was brought before the Parliament and the town and county councils by persons closely connected with the S. T. A

THE COMMITTEE FOR DESIGNING TUBERCULOSIS ESTABLISHMENTS.

In the meantime the S. T. A. was working out projects, descriptions and estimates for such tuberculosis-institutions as could not be established on the model of the public sanatoria already existing A committee, consisting of physicians and architects was appointed which in 1906 handed over detailed plans of about 20 different institutions. The report of the committee, containing among other things some 50 sketches of plans, was printed in 2,000 copies (100 pages big quarto) and distributed to persons supposed to be interested in the matter and having influence with those corporations which the question chiefly concerned. The intention was to call forth initia-

tive that perhaps lay slumbering and to afford material to eventual projectors for the. working out of their ideas.

THE S. T. A. POINTS OUT THAT ORDINARY DWELLING-HOUSES CAN BE ADAPTED FOR TUBERCULOSIS ESTABLISHMENTS.

The S. T. A. also tried to point out that it was not absolutely necessary to erect new buildings in order to gain sanatoria and homes for consumptives. On certain conditions, already existing buildings could be used for the purpose.

The Vattholma Consumptive-Home.

The above mentioned committee investigated which types of buildings were characteristic for certain parts of the country. In the publication of the S. T. A. these were reproduced both in their original form and as changed into modern hospitals for the tuberculous.

The S. T. A. also donated means to its branchdivision in the county of Upsala for the purchase of a farm. This was rebuilt at rather small expenses and turned into a tuberculosis-hospital The *Vattholma home for consumptives*, which has ever since been full of patients from the county.

The apprehension, entertained at the beginning, that the expense of such an establishment would exceed those of others, has no proved to be correct. On the contrary, experience during past year has proved, that the daily expenses are not so great as those con nected with a general hospital.

THE MEDICAL SOCIETIES SUPPORT THE NEED OF SANATORIA AND ASYLUMS. Through the initiative of the S. T. A the tuberculosis question was agai brought up for discussion in The Swedish Medical Society and a the annual meeting of the Swedish General Medical Association i 1905 and these societies, representative for the medical profession o the country, also gave the question their support by means of resolu tions in which the great lack of hospitals for consumptives and th necessity of the State's intervention were strongly pointed out.

THE GOVERNMENT APPOINTS A COMMITTEE OF ENQUIRY INTO THE CONSUMPTION QUESTION. After these preliminary step had been taken, the time wa considered to be ripe for adopting positive measures and so th S. T. A. proposed to the Government the appointment of a parlia mentary committee, whose duty it should be to thoroughly investigat the matter and to propose such measures as might be expecte from the State. At the same time the S. T. A. placed at the disposa of the committee an amount of 10,000 kronor (= about 2,652 $ to be used for this object.

Soon afterwards the Government nominated such a committee an appointed the President of the S. T. A., *Baron G. Tamm* its chairman The first work of the committee was to make investigations as regard the spread of consumption within the country. Official reports dealin with the mortality from tuberculosis were obtained and an inquir was made amongst all practitioners regarding all those cases of tuber culosis which had come under their observation during a certai period. Ninety two per cent of the medical men of the kingdon replied to the questions asked, which, considering that thi meant for many of them no little extra work, must be regarded a an exceptionally good result and one reflecting great credit upo the medical profession.

A more detailed account of these interesting investigations and of the scientific statistical revision, which the collected material underwent, has been published before in the book which was issued by the S. T. A. for the Sixth International Tuberculosis Conference in Vienna 1907.*

The figures arrived at by this committee showed that there are, at least, 30,000 consumptives in the country and that of these not less than 10,000 die yearly. Of the cases reported by the doctors in the inquiry, over 77 % were between the ages of 15—50 years. Taking the population as a whole this age-period comprises almost the half. The well known fact, that consumption preferably attacks persons in prime of life, has thus been further confirmed by this investigation.

The maps on pages 21 and 22 will show the spread of consumption in the towns and provinces of Sweden.

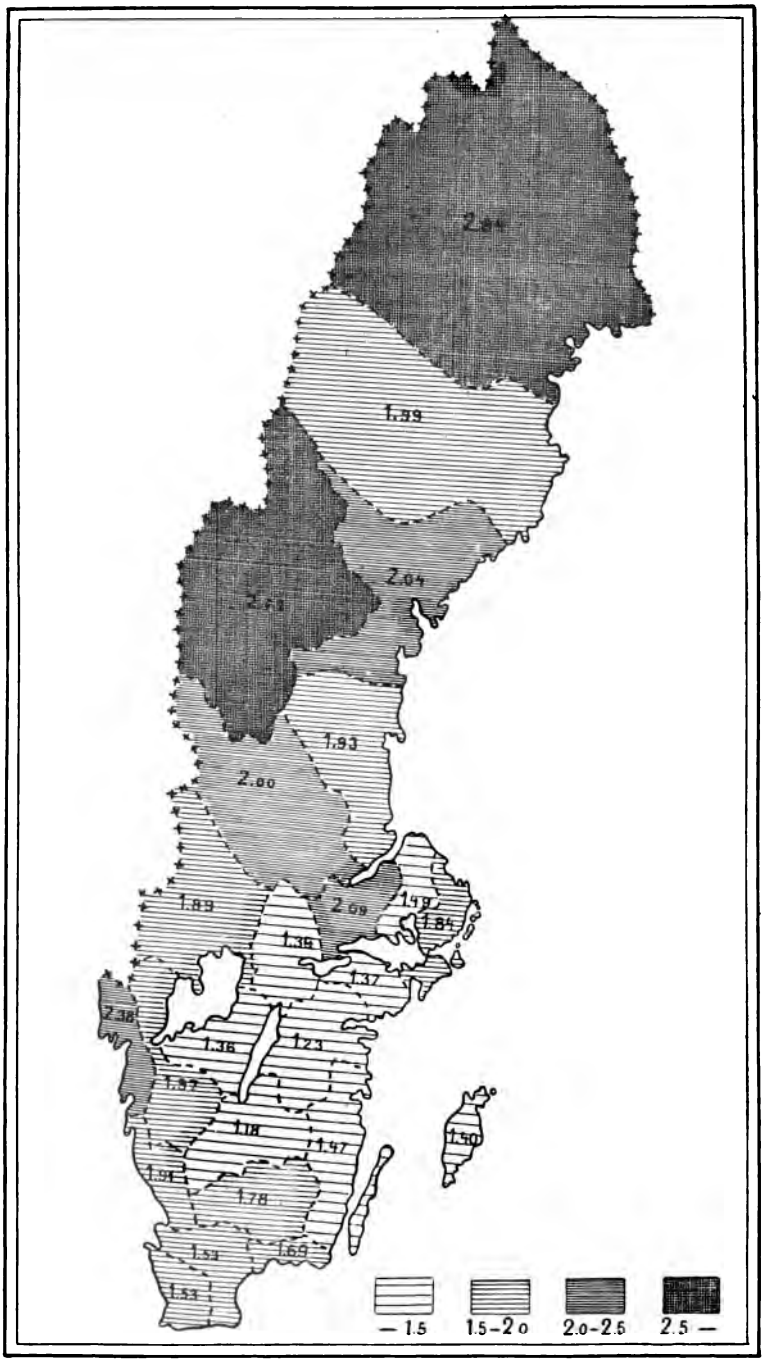
CONSUMPTION IN DIFFERENT TRADES. A perusal of the doctors' reports showed that the frequency of consumption in different trades varied to a very great extent. The most conspicuous among the group heading industrial occupations were the *tobacco workers* (men 17.02, women 35.62 per 1,000 workers in this trade throughout the kingdom), *china workers* (men 16.82, women 15.24), *printers* (men 21.77, women 19.12), *bookbinders* (men 24.24, women 33.48).

Remarkable is also the difference between *waiters* and *waitresses* (men 17.11, women 4.78), which no doubt may be explained by the abuse of alcohol by the former.

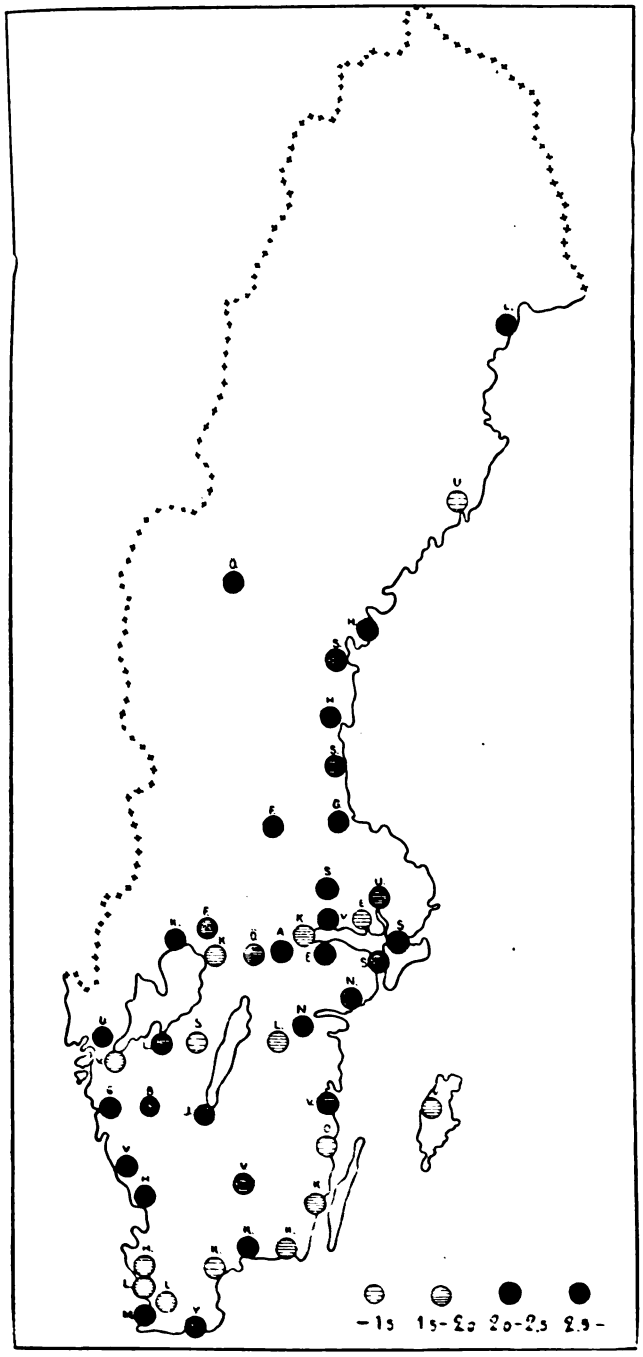
Noteworthy is too the high percentage of consumption amongst women employed in offices, banks etc. (16.81), at post and telegraph offices, telephone stations and at the railways (21.12) and among lady teachers at the primary schools (11.78).

After stating the results arrived at by the statistical inquiry and the present position of the battle against tuberculosis abroad and at home etc., the committee put forward a complete scheme for

* Bulletin de la ligue Nationale Suédoise contre la tuberculose, rédacteur Dr. Sture Carlsson, Stockholm, Centraltryckeriet 1907.



Deaths from pulmonary tuberculosis per 1000 living 1905. Rural districts.



Deaths from pulmonary tuberculosis per 1000 living 1905. Urban districts.

hospital provision of tuberculous persons together with some gener outlines for the cooperation of the State in the matter. The printe report of the committee was distributed by the S. T. A. to the leadi persons of the County Councils and municipalities and to doctors, enable them more easily to get acquainted with the question ar eventually to contribute to the progress of the scheme. The Press w at this stage also freely used for the discussion of the proposal, b sides which S. T. A's lecturers pleaded in its favour.

PARLIAMENT GIVES A MAGNIFICENT GRANT FOR THE ERECTION OF SUITABLE ESTABLISHMENTS.

After having obtained the opinic of the General Medical Council, tl governors of the counties, the chi medical officers of health of the counties and of the County Counci as regards the report of the committee, the Government placed proposal in the matter before the Parliament of 1908.

On the 20th May this year Parliament resolved that the Sta shall contribute to the erection of sanatoria and tuberculosis-hos tals to the extent of half the actual building cost, with a maximu of 1,000 kronor per bed, (about 265 $), and that the Governme should be empowered to give the necessary ground belonging to tl state and lying in the chosen district, free of cost, to County Cou cils, communes, associations and private persons intending to ere such sanatoria and hospitals.

The Diet reckoned that the total building grant during the ne ten years would amount to a sum of 4,600,000 kronor (= abo 1,219,920 $) and of this amount it assigned 400,000 kronor (= about 106,000 $) for the year 1909.

The Diet further accepted the Governments opinion that the Sta ought also to contribute to the maintenance of the patients at the hospitals. With a contribution of 50 öre (about 13 cents) per d and patient, the cost to the State during the period 1909—19 was estimated at 6,442,250 kronor (= about 1,708,485 $). Sweden Government and Diet have thus bound themselves to pay a ca amount of 11,042,250 kronor (= about 2,928,405 $) for the tube culosis movement during the next ten years, besides giving tl requisite sites of ground in the possession of the crown.

With this decision the tuberculosis problem in our country has taken a great step towards its solution. There is no doubt that the County Councils and municipal authorities will begin in earnest the erection of establishments for their consumptives.

This means a great victory for the S. T. A. and enables the association to concentrate its work on other important measures.

The Governments committee also proposes new legislation on tuberculosis. Immediately after the Parliament had attended to the above-mentioned proposition of the committee, the second and last part of the committee's report appeared in print. In this the authors, after having thoroughly discussed the matter and having given an account of the legislation on tuberculosis abroad, propose an entirely new anti-tuberculosis act, containing instructions for the medical attendant to notify each case of *death*, due to consumption, which has come under his care, and for the disinfection of the domicile, personal clothes and bedclothing of the deceased. As regards the compulsory notification of all cases *of consumption*, the committee dissuades such, having regard to the troubles and discomforts that may arise. The report also contains prescriptions regarding the duty of local Boards of Health to make the necessary arrangements to lessen the danger of infection in such cases where the consumptive lives under conditions that evidently endanger the health of those around him.

Further it is proposed that the employment of consumptive persons in the dairy trade shall be prohibited, as also the employment of consumptive persons as wet nurses.

Most of the other proposals aim at the protection of the coming generation from the danger of infection by tuberculosis. For instance, an addition is proposed to the law, dealing with the care of nurslings, saying that such children shall not be brought up in homes where someone of those coming in daily contact with the children suffers from consumption. Besides the superintendance which, according to the law in its present form, is the duty of the Board of Health to exercise with regard to nurslings, the committee proposes, that the Poor Law Authorities who board out children shall also take care that these do not live under such conditions as above mentioned.

As might be expected the committee has paid special attention to schoolhygiene. Persons suffering from consumption in an infectious stage shall not be allowed to act as teachers. Therefore the teacher, before being appointed, must show a doctor's certificate, and should a teacher contract the disease after his appointment, he may be suspended from service and, if his condition does not improve within one year, he may be dismissed. In such cases, however, he shall suffer as little pecuniary loss as possible.

Moreover, according to the proposal, pupils declared by doctors to be suffering from infectious consumption are, according to circumstances, liable to temporary suspension or to dismissal from the school. At the same time instructions shall be given if, and in what way, the pupil may get tuition.

Finally, detailed instructions have been worked out regarding the cleaning and ventilation of primary schools and infant schools.

It has also been the object of the committee to consider the connection between hygiene in dwelling houses and in factories on the one hand and the prevalence of tuberculosis on the other. With regard to domestic hygiene the committee has proposed, that the rules of hygiene shall contain an express stipulation regarding the duty of the Board of Health to exercise a control over the hygiene of private houses. A bill containing these various propositions has now to be worked out by the Government and the S. T. A. has arranged that those persons, who have interests to watch, shall have an opportunity of being heard. To this purpose the S. T. A. has distributed a large number of copies of the report. The Press, which has received a summary of the propositions from the S. T. A., has already brought up the question for discussion.

SUMMER SANATORIA.

At the time of the founding of the S. T. A. there existed only one summer sanatorium in the country, namely at *Gothenburg*. It is true that such establishments, on account of the short period our climate permits this kind of treatment, cannot be one of the more important measures in our endeavours to care for consumptives.

The S. T. A. none the less considered it its duty to try to introduce this kind of treatment too.

An opportunity to do so was forthcoming in the town of *Eskilstuna*, one of our greatest industrial centres, where a wish was expressed to arrange a summer sanatorium as an experiment. The S. T. A. donated a sum for the purpose, private persons supplied the rest, and thus the sanatorium came into existence. The first year was sufficient to show that the trial had been exceptionally successful. The summer sanatorium at Eskilstuna is now kept open some months every year and supplies a real need among the working population of the little town.

Such establishments have since been started in several other provincial towns.

DISPENSARIES.

The most interesting departure, which has been made during the present phase of the struggle against tuberculosis, is undoubtedly *Calmette's* brilliant idea of developing the use of dispensaries as an effective weapon against tuberculosis.

However important sanatoria and asylums may be, consumptives cannot, in any case, spend the whole of their lives in such places; neither can the result of a cure at a closed establishment be so far-reaching as to provide a safe protection against the danger of infection to the patient's family. Then even if he is treated time after time at a sanatorium, where he is carefully taught everything to be observed, he is unable, when at home, to follow without supervision the rules of special tuberculosis hygiene as punctually, as he is obliged to when living under the discipline of a sanatorium. And it is also of the greatest importance, when the patient is isolated away from home, that those left at home receive advice and help and that a watchful eye observes what is going on there.

SWEDEN'S FIRST DISPENSARY.

The S. T. A. clearly saw how necessary it was to open the way for the introduction of dispensaries, at the same time as the agitation for the erection of sanatoria and tuberculosis hospitals was carried on.

The branch of the S. T. A. in Upsala was willing to take the first step. A plan for a dispensary on French lines was prepared and the energetic tuberculosis association in our largest university town received from the S. T. A. a contribution of 6,000 kronor (about 1,590 $) for the start. Further grants were given soon after by Upsala town, by the governor of the province and by several private persons, and at the close of 1905 our first dispensary was able to begin its work. One of the younger teachers at the medical faculty is medical superintendent, a number of ladies of the town assist in watching over the hygiene in the homes, and a hospital nurse superintends the daily work. The material support which is given consists of milk, meat, margarine, lard, fuel and clothes. Occasionally a contribution towards the rent is given to enable the family to secure better apartments. During the summer the dispensary in certain cases defrays the expenses connected with the sending of the children, and sometimes of the patients, into the country. Assistance in cleaning the homes is given now and then. Medical advice and medicine is to be had free of cost, as also popular pamphlets dealing with tuberculosis and printed instructions.

An interesting experiment has also been made there in arranging for the patients an open air treatment in their homes. The short treatise by Dr. Tillman entitled "Sanatorium treatment at home" published by the S. T. A.,* has been a useful guide to this work. These experiments have generally been very successful.

DISPENSARIES IN STOCKHOLM AND OTHER TOWNS, AND IN THE COUNTRY.

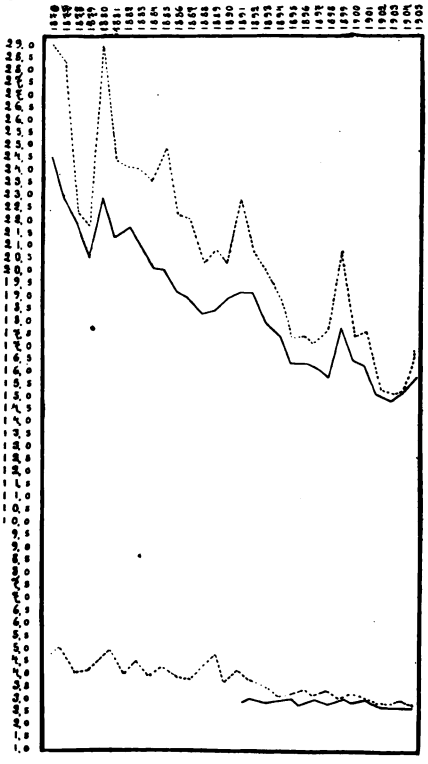
The example set by Upsala soon gave rise to several dispensaries. In the following year the town council fitted out such a one in Stockholm. In the town of Örebro, where the branch of the S. T. A. supported by the local savings-bank took up the idea, another one was started the same year.

Before long similar institutions will be opened in some other towns, besides which efforts are being made in one province to adopt the dispensary idea with the help of ambulatory nurses.

* Page 53.

SOCIAL-HYGIENIC EXPERIMENTS.

There can be but one opinion as to the absolute necessity of sanatoria, hospitals, asylums and other establishments as weapons in the struggle against tuberculosis, and it must be commonly acknowledged that without them the goal could not be reached. We now know where these establishments should lie, the manner in which they are to be built and how the patients admitted should be treated. As to the number of such establishments to be erected, that is merely a question of money.



The upper lines.
—— Deaths from all diseases pr 1,000 living in the towns of Sweden 1897—1905.
..... D:o D:o in Stockholm.
The lower lines.
—— Deaths from tuberculosis pr 1,000 living in the towns of Sweden 1876—1905.
..... D:o d:o in Stockholm.

We cannot, however, expect that the consumption fiend will be defeated by hospitals alone. Other measures are needed to complete the usefulness of the hospitals, by paying attention at the periods when the patients are not isolated.

The general death-rate here in Sweden, as in other civilised countries, has enormously decreased during the last decades. The reason of this can hardly be ascribed to anything else than to such general improvements as the progress of general education, increased prosperity, improved hygienic arrangements and more modern methods of caring for the sick have brought about.

Meanwhile the mortality due to consumption, has everywhere remained almost stationary, our own country not excepted, as the accompanying curvediagram shows.

In all probability this depends not only upon the lack of sufficient establishments for tuberculous people, but also upon the fact that the

hygienic improvements, that have hitherto been carried out, have only to a small degree influenced the healthiness of the homes, just as they have only to a very small extent affected the personal hygiene of consumptives and their intercourse with the family.

If the above argument is correct, and if the frequency of the disease is to be affected by the intervention of the public, new clauses must be added to the regulations of hygiene at present in force. The doors must be opened for hygiene to enter the homes of consumptives, and naturally first of all the homes of the poorer classes, there to give advice and tender help.

At present, however, we know but little of the details of tuberculosis hygiene for the home. We do certainly know that tuberculosis and scanty house room go hand in hand; we entertain the hope that, as we improve the dwellings of the poorer classes, we shall to the same extent experience a decrease in consumption. On the other hand we know very little as to what to do in a poor man's house to render the patient harmless when living with his family and at the same time to ensure his receiving good nursing. Experience is also wanting as to how to keep order and cleanliness in a poor home, where children are often numerous, without enforcing greater restrictions than can be tolerated. We are also ignorant as to which of our prophylactic precautionary measures are essential, and which can without risk be disregarded. Neither do we know how far we dare press our claims for obedidence to the laws of hygiene in the home, without depriving it of its private character.

It seems that information on this point and on many other points connected with the question as to what ought to be done in homes, where consumption has found its way, cannot be obtained in any other way than by methodically carrying out a number of well chosen social-hygienic experiments likely to supply most material evidence upon the subject.

If the S. T. A. could prove that protection against the bacilli which consumptives expectorate can be introduced even in the homes of the working classes without placing material restrictions upon home comforts and without being too expensive, there is

every reason to suppose that the method, thus adopted and found appropriate, would afterwards be readily accepted throughout the country.

In planning these experiments the S. T. A. has proceeded from the theory which, independent of different opinions regarding questions of detail, at the present time more and more gains the support of science, namely that tuberculosis through the expectorations of those attacked by the disease is conveyed to the individual in most cases already during childhood and especially during infancy, although the disease seldom breaks out before maturity, and that in consequence of this, the fight against the disease must aim at the protecting coming generation from infection.

The social-hygienic experiments in question must thus aim at protecting the children in the home from coming into contact with the expectorations coughed up by any tuberculous member of the family.

The conditions of life among the working classes of the towns in Sweden, however, are widely different to those prevailing in similar classes in the country. It was therefore necessary to divide the experiments into two groups, one for the town and one for the country.

DWELLING HOUSE IN STOCKHOLM FOR CONSUMPTIVE WORKMEN WITH HEALTHY CHILDREN.

The experiment concerning the town population was carried out in Stockholm. The S. T. A. rented a house on the outskirts of the town, which had for many years served as a dwelling house for workmen's families, and which corresponded to, or perhaps was somewhat inferior to the average workman's residence.

In this house were fourteen tenements, consisting of one or two rooms and a kitchen. Two of the flats were reserved for the nurse and offices etc. The others were let out to twelve workmens' families, of which the father or the mother, or both, were obviously suffering from consumption but still able to work. The children of the families were, as far as careful medical examination could ascertain, quite healthy.

The condition, that the person attacked by the disease had to be fit for work, was made partly because we naturally had no wish to take in any family that could soon cease to be a suitable object for the experiment on account of the patient's death, and partly because the idea was to study how matters would turn out when the patient was not in need of hospital care. In order to obtain truthful evidence it was necessary not to take in any children which were evidently infected from the beginning.

Difficulties were immediately experienced, however, in finding families qualified for the purpose, for although the district medical officers, who were requested to propose suitable tenants, declared the children to be healthy, a more thorough examination, carried out by the doctor specially engaged to supervise the experiment, proved that the children of poor consumptive parents were rarely completely free from traces of the illness themselves. More than seventy families were examined before twelve fully qualified could be accepted.

These families moved in during the autumn of 1904, without the flats having undergone any alterations which could deprive them of their character of private apartments.

During the course of years a certain change has naturally taken place with regard to the tenants, depending upon the death of the sick member of the family, or because for one reason or another.

During the years 1904—1907 altogether 24 families have been living in the house. In 9 of these the father was consumptive, in 11 the mother and in 4 both. The number of children has fluctuated between 6 and 1 per family, whilst 4 births have been registered.

Twelve families have moved.

Illness among the children has been about normal. Several children have been attacked by prevailing infectious diseases, and

some few deaths have taken place from diseases other than tuberculosis. Two children died during the first months after moving in, from tuberculous meningitis, but otherwise there has been no case of illness or death from tuberculosis. The children are, in general, robust and appear to be healthy.

An effort is being made to observe the children who have left by submitting them to a medical examination once a year. For this they receive cash payment. Of the 29 children who have left 18 have thus been examined. None of them showed signs of tuberculosis.

The arrangements for the experiment may briefly be said to take place as follows.

The rent is lowered with respect to the decreased working capacity of the person attacked by the disease, but it must be paid punctually, in order that the experiment may keep its character and no ordinary charitable institution be established in its place.

The nurse who lives in the house pays a daily visit to every family and gives instructions and advice as to cleaning, ventilation etc. The greatest stress is laid upon the destruction of the expectorations. Spittoons and pocket-flasks are distributed. The patient is not permitted to sleep in the same room as the children. A strict watch is kept to prevent milk and other food being left uncovered. During the summer the flies are caught.

The children are bathed at home, but the adults have a free bath twice monthly at a bathing establishment in the neighbourhood.

In compensation for the loss of warmth through extra ventilation a certain quantity of fuel is allowed to each household. Assistance in thoroughly cleaning the flats is given every month. Beds are to be had if necessary, in order that the patient may not be hindered from arranging his sleeping apartment according to the rules.

During a part of the summer the children are sent to the country free of cost. In order to ensure the children being well nourished they all receive every morning a large portion of porridge, gruel or the like.

Printed instructions and rules are posted in every flat, and popular pamphlets on tuberculosis are now and then distributed among the tenants.

The tenants enjoy full freedom in everything not connected with medical attendance and hygiene, and the nurse is strictly prohibited in any other way to criticise or give instructions.

The house is under the superintendance of a doctor appointed by the S. T. A. and specially trained in sanatorium work, who visits it as often as occasion demands.

At present it is too early to draw any safe conclusions as to the result of this trial. Experience, however, has shown that the tenants permit without grumbling the encroachment upon their liberty that is caused by the hygienic superintendance, and that most of them try their best to protect their children from the danger of infection in the way they are being taught. The fact that, up to the present, no children have obviously caught the disease since moving in, must to some extent be considered encouraging.

Through this experiment the S. T. A. hopes to prove, that a barrier can be raised, even in the homes of the poor, between the bacilli of the tuberculous person and his children with comparatively simple precautionary measures.

As the house at present in use is soon to make way for a new street, and as it is exceptionally difficult to find a house in Stockholm suitable for our needs, the S. T. A. has decided to erect one itself. Some modern arrangements will certainly be utilised in the new house, but none the less, great stress will be laid upon the importance of not departing from the ordinary type of workmens' dwellings as far as the building and its accommodation is concerned.

WAR OF EXTERMINATION AGAINST TUBERCULOSIS IN A PROVINCIAL MUNICIPALITY.

The programme for the arrangement of the social hygienic experiment in the country was planned so as to give the S. T. A. an opportunity to fight against the illness, in accordance with the above mentioned principles, within a limited district, comparatively untouched by the outer world, situated in an out of the way part

of the country and badly provided with means of communication, the population not being engaged in industrial pursuits nor living close together as in the towns, and where consumption was very much spread.

A general examination of the condition of the health of the population was to be immediately made, and the result of the work should be judged some years later after a new general examination.

After a careful search it was decided that the trial should take place in the parish of Lower-Luleå in the province of Norrbotten, in one of the most northern parts of the kingdom, lying between 65° and 66° lat. on the coast of the Gulf of Bothnia, about 1,7 kilometer south of the residential town of Luleå.

The population there consists almost entirely of farmers and fishermen, who cannot exactly be said to suffer want, but who nevertheless have no more than is necessary for their existence. They are industrious and intelligent, but have primitive ideas of hygiene. Their houses are in general roomy, but are not used to full advantage. As a rule the whole family lives in the kitchen, whilst the rest of the house stands unused and unheated, except upon festive occasions which are few and far between. The long cold winter nights are spent with the people lying huddled together in furs in beds, fastened to the walls and fitted with tight-shutting doors, called "cupboard-beds".

Means for ventilation are completely wanting, and the windows are nailed from the outside so that they cannot be opened during the winter. The house is generally kept clean. The floors, for instance, are oil-painted every year and are often scrubbed, but for the sake of warmth they are covered with carpets generally of the worst kind. The food, as regards quantity is, as a rule, sufficient but the quality is very unsatisfactory. It chiefly consists of milk foods, potatoes and coffee and only on very rare occasions meat or fish is given. The cooking is extremely primitive.

In this parish the neighbouring villages of Antnäs, Ersnäs, Alvik, and Långnäs were chosen making an area of 23,158 hektar and a population of about 2,000 persons. The S. T. A. bought a large house in the most central village, called Antnäs, which was turned into a hospital, children's home and a doctor's residence. Another house has since been hired for patients and servants.

A bathing establishment, containing also the laundry, was erected and an open hall provided for the patients. The establishment was called "Hälsan" "*Health.*"

On the 1st of March 1906 work was commenced, when a doctor, engaged by the S. T. A., accompanied by two nurses, well trained for their task, took up their residence there.

The medical examinations, which were at once begun and methodically continued, fully confirmed the supposition that consumption

Room with cupboard beds: Antnäs.

as well as scrofulosis were very prevalent in the above-mentioned villages. As regards the result of the investigations made in the district, reference may be made to Dr. Neander's paper.*

The work is now carried on in the following manner. Before the different members of the household are examined, the home is inspected by one of the nurses who makes, what may be called "a sketch" of the home, noting the number of persons constituting the family, the sleeping apartments and beds, the condition of the

* Page 43.

windows and fireplaces, the degree of cleanliness and other hygienic matters etc. With the help of this sketch or report the doctor gives general instructions as to what alterations ought to be made, these being noted on the sketch. In order to ensure the observance of these instructions the doctor and the nurses inspect the home from time to time.

Should a house be in need of alteration to ensure better ventilation, or should it be found necessary to put in or repair a fireplace

"Hälsan" at Antnäs.

in order to render a room habitable, which otherwise could not be used during the winter, the cost of such work is defrayed by the S. T. A., if the tenant will not or cannot pay himself. In such cases where there is a lack of sufficient beds, to allow of each person sleeping alone, beds are supplied by the S. T. A.

Consumptives, who on account of the conditions at home, cannot safely stay at home without a risk of infecting the children, get lodgings in another house at the expense of the S. T. A.

Healthy children from consumptive homes are, by permission of their parents, taken into "Health" or boarded out in families where there is no consumption.

Spittoons and sputum-cups may be had free of charge, and the nurses give instructions as to how they should be cleaned, and also how cleanliness in other ways is to be observed.

To ensure personal cleanliness, baths are to be had gratis. Since the bathing establishment has been opened, the number of baths given has amounted to about 4,000.

Consumptives in need of sanatorium treatment are taken into "Health" for shorter or longer periods, or have the opportunity of undergoing the open-air-treatment, either with or without board.

Special attention is paid to children suffering from scrofulosis. If there be reason to suppose that they do not get sufficient or suitable food, they are wholly or partially boarded at "Health". All children having scrofulosis are supplied with cod-liver oil and other medicine free of cost.

Effort are made to interest the public in the work and to improve their knowledge of tuberculosis hygiene by means of occasional lectures and discussions and by distributing a large number of popular pamphlets dealing with the disease.

The working expenses of this experiment are borne by "The Grängesberg—Oxelösund Mining Company Ltd.", which has voted for this purpose a sum of 12,000 kronor (= about 3,182 $) a year, for a period of eight years.

NO PARALLELISM BETWEEN TUBERCULOSIS IN HUMAN BEINGS AND TUBERCULOSIS IN CATTLE.

The exceptionally favourable opportunity that presented itself within the district for a more minute investigation of the difficult question as to the connection between human and animal tuberculosis, caused the S. T. A. to endeavour to make a thorough research in this respect.

A large number of the cattle belonging to farms within the district were last year by the hospital doctor together with veterinary surgeons inoculated with tuberculine. This investigation proved that although the cattle come in to very close contact with the

people in their daily life, and in spite of the fact that consumption is very prevalent among the latter, not a single animal showed reaction. A more detailed account of these investigations has been published in a brochure in the French language, distributed at the Sixth International Tuberculosis Conference in Vienna 1907.*

THE CARE OF THE HEALTHY CHILDREN OF CONSUMPTIVE PARENTS.

There is certainly every reason to hope that the progress of consumption will be considerably checked through a more extensive system of isolation of consumptives in sanatoria and other establishments and through the introduction of better principles of hygiene into the daily life of the people.

But in many cases, especially in poor homes, the condition of things must necessarily baffle all our efforts to protect the growing child from the danger of infection. The consumptive member of the family, however good his intentions may be, cannot possibly be as careful at home as he ought. He neither can nor will perpetually stay at a hospital, permanently separated from the family. It even sometimes occurs that the cleanliness of the home and the management of the children, on account of lack of ability or interest in the person upon whom the responsibility lies, cannot be improved even though financial support is given. In such cases nothing remains to be done but to try to remove to another house those children that are still healthy and who can thus be saved.

To partially break up the home in this manner must, of course, always be met with difficulties and has also its great dangers, but in choosing between this and the almost absolute certainty that the children will otherwise be lost, there can be no hesitation.

Grancher, the late French scientist, has also proved that the method is practically possible. The character of the people and the social conditions in France, certainly seem more favourable to this rational measure against tuberculosis than elsewhere, or at any rate here in Sweden. The S. T. A., however, considered it a duty to try the experiment.

* Bulletin de la ligue nationale suédoise contre la tuberculose, rédacteur dr. Sture Carlsson. Centraltryckeriet 1907.

COMMITTEES FOR THE CARE OF CHILDREN ARE FORMED IN SEVEN DIFFERENT COUNTIES.

In the year 1906, therefore, Special Committees for the care of children were formed in seven different provinces with a view of taking this part of the work in hand, and 50,000 kronor (about 13,260 $) were set aside for the object.

In order that a "children's committee" shall have the right to take a child into its charge, the rules enacted by the S. T. A. state that the parents of the child shall have expressed this to be their wish, that a doctor shall have testified the presence of consumption of an infectious nature within the home and that the conditions there are such as to greatly endanger the child, and, finally, that a medical man at the request of the committee has examined the child and, as far as can be seen from a careful examination, has found it to be free from tuberculosis.

The child is boarded out in a home, where foundlings are received, either in the country or in a small town. The new home shall not be so far away from that of the parents of the child as to prevent them sometimes seeing each other. The home shall have been examined by the doctor and declared healthy and in every way suitable. Later on it shall be inspected at least once a year by the committee's doctor. The foster-home and the child residing there shall be under the perpetual superintendance of a representative of the S. T. A. living in the neighbourhood, whose duty, among other things, shall be to keep up the connection with the parents and to let them know from time to time how the child is.

When the consumptive mother or father recovers or dies, or when the condition of things in the parents' home becomes from other reasons so far changed that there is no longer any danger of infection, the child is to return home.

TEMPORARY HOMES FOR HEALTHY CHILDREN.

Experience has shown, however, that parents often object to send their children to other families, but do not mind letting them go to a children's home or other similar institution. The bringing up and education of children within hospitals has, of course, its hygienic and social dangers, but such, however, can be almost

overcome if the home is properly managed. In any case it was quite necessary for the S. T. A. to find one or more depôts to use in cases where suitable foster-homes can not be immediately found.

An exceptionally energetic branch association in the small idyllic country-town of Kungsör, right in the heart of the country, undertook to see to the matter. A farm was hired there and was made ready for 20 children, and here the children were looked after by a lady teacher, especially well trained in child nursing.

There is a good school in the town and splendid opportunities for the elder children to learn gardening or some other handicraft.

As the building left much to be desired, the S. T. A. decided to enable the afore-mentioned branch association to build its own children's home. The building is at present under construction and will be ready for use during the course of the year.

A similar home is situated near the town of Gothenburg called, "The Birthday". It is supported by the S. T. A. but is otherwise dependent upon gifts which charitable persons annually contribute upon their own birthdays, or the birthdays of persons near and dear to them.

In Stockholm, the authorities for the relief of the poor have now taken this kind of work in hand and during the years 1906—1907 have, upon the principles described above, undertaken the care at their own expense of altogether 53 children.

In Gothenburg this work is carried on entirely by a private association, which during 1907 took care of about 30 children.

Through the committees for the protection of children the S. T. A. has in this way been able to remove during 1906, 73 children and during 1907, 98 children from the seat of infection at home.

The fees for most of the farmed out children have been paid by the S. T. A's committees; in some cases the commune has contributed towards the expense and in one or two cases the parents have helped. All expenses caused by medical examinations, inspections of the homes etc. have been defrayed by the S. T. A.

The efforts which have been made to set this work on foot have been rather considerable, and if they are compared with the small number of children that have been cared for, one is compelled to admit that the S. T. A. has suffered a defeat.

A slight increase has, however, taken place during the last year, and we continue to hope that this method will be used on a larger scale as soon as the confidence of the parents in this system has become more stable. Any great extent of this branch of our work can, nevertheless, not be expected, on accountof the deplorable fact already mentioned, that perfectly healthy children are so seldom found in the homes of poor consumptive parents.

America, where so many Swedish men and women have found their second home, naturally claims much attention in our country We follow with great interest the wonderful development noticed there in almost every branch of culture. Our medical men, philanthropists and sociologists have often chosen the United States for their studies, and in doing so they have been compelled to observe with interest the energetic and conscientious struggle which in many States is being conducted against tuberculosis. We have with the greatest respect and satisfaction noticed the usually admirable, ingenious and practical methods which America has adopted in her struggle against tuberculosis. Not less imposing is the sanatorium treatment there as represented by Dr. Trudeau's sanatorium and several other similar model establishments for the cure and care of consumptives.

The Swedish National Anti-Tuberculosis Association has not neglected to observe and learn from the lessons which the conditions on the other side of the ocean provide, just as our association, naturally enough, has been influenced in many ways by the impulses and ideas emanating from the leading European nations.

It stands, to reason, that a small country like ours must in many respects, and in the tuberculosis movement too, take such measures as will suit its own particular needs. Our limited pecuniary resources compel us to plan the struggle on a less pretentious scale.

This want of means has obliged us to invent certain measures ourselves which may be valueless to other countries, but which suit us, and therefore our fight against tuberculosis possesses, in many respects, features unknown elsewhere, a fact which makes it perhaps difficult for an outsider to see the reason of some of our actions.

We hope, nevertheless, that the course we have followed will finally lead us also to the goal and we desire nothing better than that our brethren in the struggle, whether on this side of the ocean or the other, will see that we fully appreciate the international duty, which requires every civilised nation to enlist in the ranks to combat against this common enemy.

THE SOCIAL-HYGIENIC EXPERIMENTS MADE IN THE PARISH OF LOWER-LULEÅ.

BY

G. NEANDER, M. D.

THE SPECIAL number issued by the Swedish National Anti-tuberculosis Association for the Fifth International Tuberculosis Conference held at Hague in 1906, contains a report of the social-hygienic experiments which had just then been commenced in the far north of Sweden.

The object of the experiments was, partly, to make a most careful investigation as regards the spread of the disease within a limited district inhabited by a residential population known to have a high percentage of consumption, and, partly, to endeavour to improve the general hygiene there by means of combined dispensary and sanatorium work, and by keeping a very sharp look out, chiefly by letting the doctor and nurses attached to the hospital pay repeated visits to the people's homes.

The district chosen for the experiment consists of four villages: Antnäs, Ersnäs, Alvik and Långnäs in the parish of Lower-Luleå in the county of Norrbotten, on the east coast, of the most northern part of Sweden (about 65.5° north). The population of the district amounts in round numbers to 2,000 persons and the number of dwelling houses is about 375.

As the work of the station has now been going on for two years, a general report of the work might not be without interest, and I give below the results of the investigations made regarding the spread of tuberculosis.

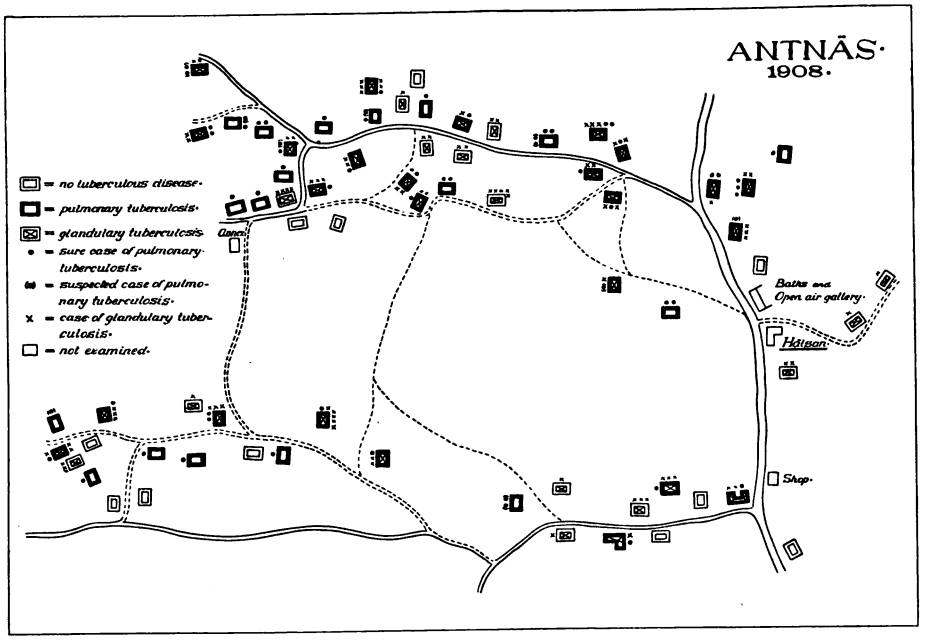
During the year 1906, Dr. E. Danielsson, who was then the leader

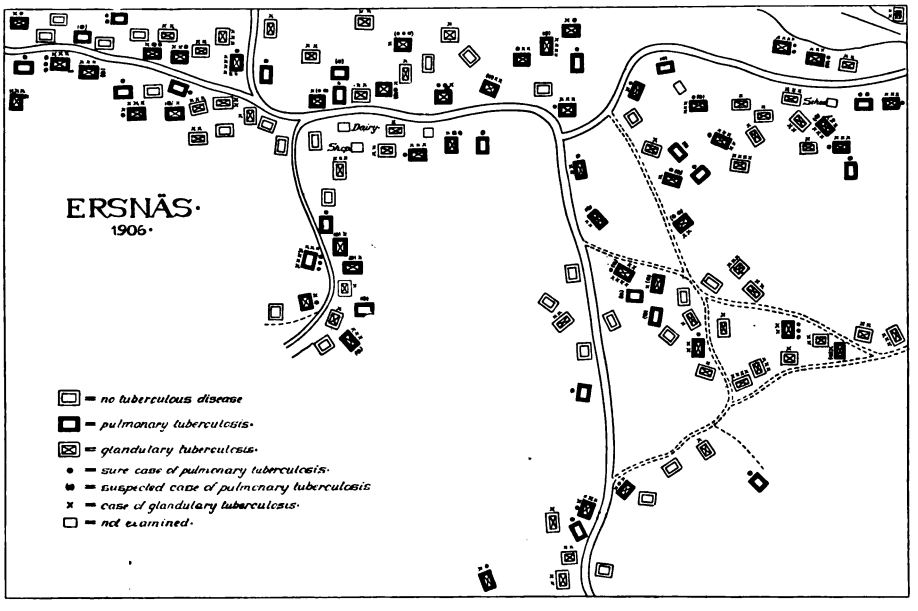
of the work, made a medical examination of the population in as complete and extensive a manner as possible. Of the 2293 registered inhabitants 1498 were examined. The result of the examination will be seen by glancing at the following table.

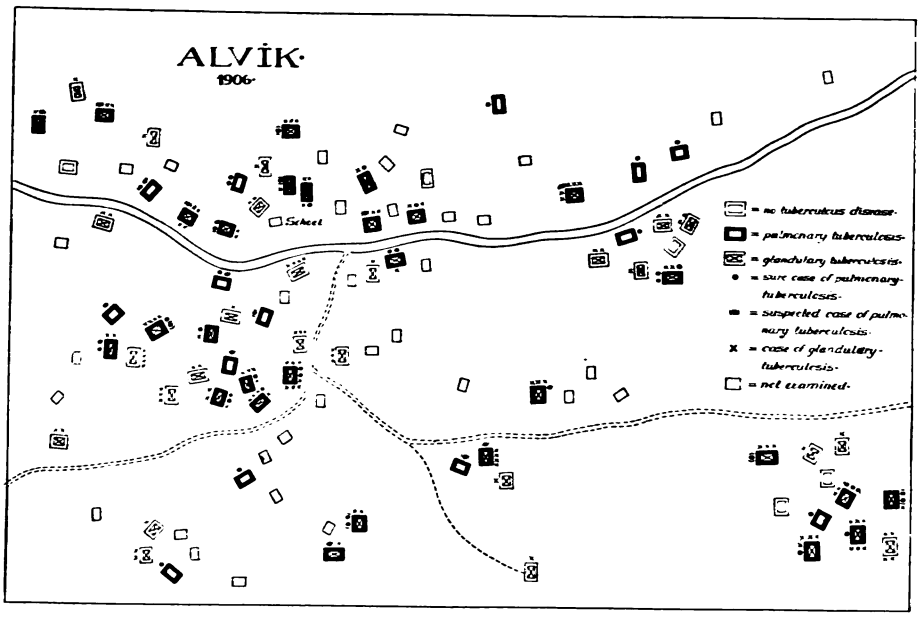
	Antnäs	Ersnäs	Långnäs-Alvik	Total
Number of inhabitants	381	885	1027	2293
» examined	336	573	589	1498
of which number adults.....	210	335	376	921
» » children under 15 ...	126	238	213	577
Among the adults:				
Tuberculosis	41	52	45	138
Doubtful cases	23	36	29	88
Tuberculosis in glands	24	43	28	95
Among the children:				
Tuberculosis	8	8	7	23
» in glands	76	162	119	357
Total number of cases:				
Tuberculosis	49	60	52	161
Doubtful cases	23	36	29	88
Tuberculosis in glands	100	205	147	452
Giving a percentage of				
Adults:				
Tuberculosis	19.5 %	15.5 %	11.97 %	14.98 %
Doubtful cases	10.95 %	10.7 %	7.70 %	9.55 %
Tuberculosis in glands	11.4 %	12.8 %	7.44 %	10.31 %
Children:				
Tuberculosis	6.3 %	3.3 %	3.28 %	3.38 %
» in glands	60.3 %	68.06 %	55.86 %	61.87 %
Of the total number examined:				
Tuberculosis	14.58 %	10.4 %	8.82 %	10.7 %
Doubtful cases	6.9 %	6.2 %	4.92 %	5.9 %
Tuberculosis in glands	29.7 %	35.7 %	24.95 %	30.2 %

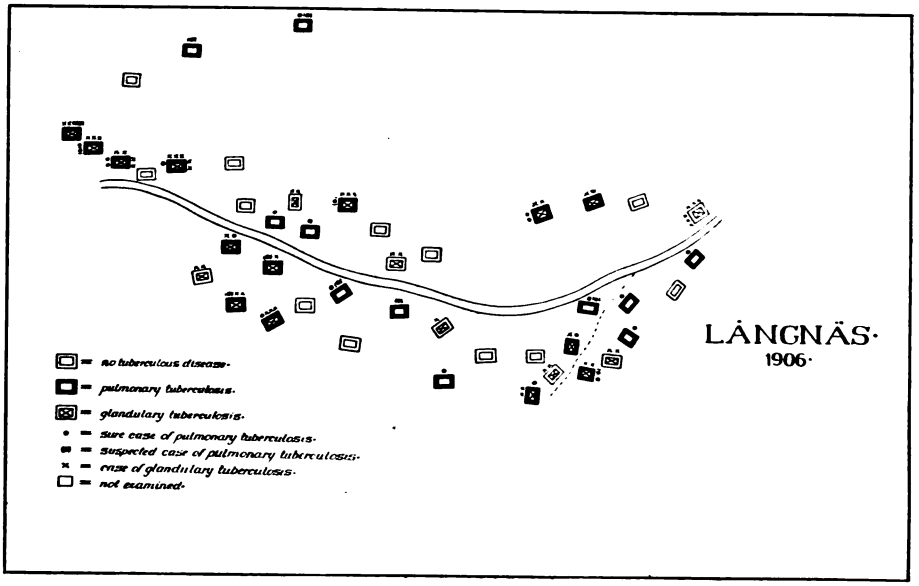
From these figures it will be seen that tuberculosis is enormously spread within the district chosen for the experiments.

In order to make it clearer, the reader is refered to the annexed map of the district, on which will be found the houses, together with all the cases of consumption and glandular tuberculosis.


ANTNÄS·
1908·
= no tuberculous disease·
= pulmonary tuberculosis·
= glandulary tuberculosis·
= sure case of pulmonary tuberculosis·
= suspected case of pulmonary tuberculosis·
x = case of glandulary tuberculosis·
= not examined·
Baths and Open air gallery·
Hälsan·
Shop·


ERSNÄS·
1906·
Dairy·
Shop·
School·
= no tuberculous disease
= pulmonary tuberculosis·
= glandulary tuberculosis·
= sure case of pulmonary tuberculosis·
= suspected case of pulmonary tuberculosis
x = case of glandulary tuberculosis·
= not examined·


ALVIK·
1906·
School
= no tuberculous disease·
= pulmonary tuberculosis·
= glandulary tuberculosis·
= sure case of pulmonary tuberculosis·
= suspected case of pulmonary tuberculosis·
= case of glandulary tuberculosis·
= not examined·


LÅNGNÄS·
1906·
= no tuberculous disease·
= pulmonary tuberculosis·
= glandulary tuberculosis·
= sure case of pulmonary tuberculosis·
= suspected case of pulmonary tuberculosis·
= case of glandulary tuberculosis·
= not examined·

In April 1908 another examination of the inhabitants was commenced, which was concluded in the village of Antnäs at the time of writing. The result of this examination is given here and, for the sake of comparison, we reprint the figures from that made in 1906.

Antnäs	1908	1906
Number of inhabitants	393	381
» » examined	359	336
of which number adults	208	210
» » » » children under 15	151	126
Adults:		
Tuberculosis	45	41
Doubtful cases	16	23
Tuberculosis in glands	12	24
Children:		
Tuberculosis	9	8
Doubtful cases	1	—
Tuberculosis in glands	75	76
Total number of cases:		
Tuberculosis	54	49
Doubtful cases	17	23
Tuberculosis in glands	87	100
Giving a percentage of: *Adults:*		
Tuberculosis	21.1 %	19.5 %
Doubtful cases	7.7 %	10.95 %
Tuberculosis in glands	5.8 %	11.4 %
Children:		
Tuberculosis	5.9 %	6.3 %
Doubtful cases	0.66 %	—
Tuberculosis in glands	49.7 %	60.3 %
Percentage of total number examined:		
Tuberculosis	15.0 %	14.58 %
Doubtful cases	4.7 %	6.9 %
Tuberculosis in glands	24.0 %	29.7 %

The greatest difference shown by these two examinations may be noticed under the heading of "Tuberculosis in glands among children" where the figure seems to have dropped from 60.3 % in

the year 1906, to 49.7 % in 1908. Possibly this difference may partly be explained by the fact that the two examinations were carried out by different doctors; although the latter endeavoured as far as possible to follow the same views of his predecessor. The decrease, however, may be regarded as the visible effect of efforts made during the last two chiefly years to teach the parentshow to treat their children rationally, by seeing that they obtain fresh air, sun and more nourishing food.

As regards the 49 persons, who were registered under the heading "Tuberculosis" (that is to say, were slightly infected) at the examination of 1906, the last examination has shown:

Tuberculosis	39	
Dead	6	
Doubtful cases	2	
Not examined (away from home)	2	49

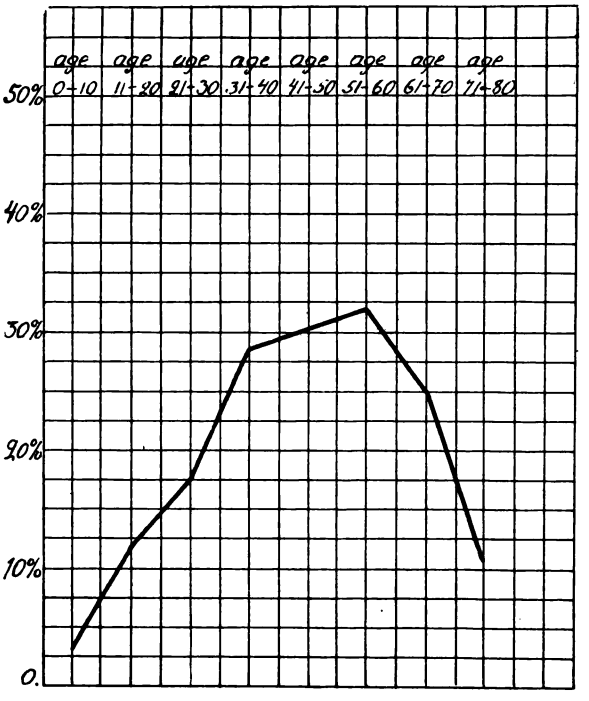
The 23 persons who were registered in 1906 as "Doubtful cases" were noted in the examination of 1908 as follows:

Doubtful cases	12	
Tuberculosis	7	
Without symptoms	3	
Dead	1	23

The examination of 1906 found 100 persons in Antnäs suffering from tuberculosis in the glands (24 adults and 76 children). In 1908 they were registered as follows:

	Adults	Children
Tuberculosis in glands	10	56
»	—	1
Doubtful cases	1	—
Without symptoms	8	19
Dead	2	—
Not examined	3	—
Sum	24	76

The frequency of consumption is made clear by the following diagram, which gives the percentage of consumptives among those examined and arranged in groups, each group being a ten-year-age-period. A glance at this will show the comparatively high percentage of elderly persons suffering from tuberculosis. These aged victims of chronic consumption have, as a rule, a cough accompanied with abundant expectoration, and feel "*a heaviness on the chest*" but are otherwise fairly active and fit for work. They are of great importance, partly because it is so difficult to make them adopt modern ideas of cleanliness and precaution in dealing with their expectoration, and on account of the opposition they generally offer to reforms in the home, above all to the removal of the so called cupboardbeds and, partly, because the other members of the family do the heavy work, leaving them to look after the youngest children with whom they often share their beds.



The frequency of tuberculosis of the lungs in Antnäs according to investigations made 1908, expressed in percentage of the number examined persons within each age-class - of ten years -.

The frequency of tuberculosis in the glands is shown by the succeeding diagram.

The frequency of tuberculosis of the glands in Antnäs according to investigations made 1908, expressed in percentage of number examined persons within each ageclass of two years.

The population at Antnäs is divided into 76 households (families). The size of the households will be seen from the following figures.

12	members	2	families
11	»	1	»
10	»	2	»
9	»	3	»
8	»	5	»
7	»	10	»
6	»	10	»
5	»	9	»
4	»	12	»
3	»	9	»
2	»	8	»
1	»	5	»
		76	families

The number of young children (under 15) in the different families.

8	children	in	1	family
7	»	»	3	families
6	»	»	2	»
5	»	»	4	»
4	»	»	8	»
3	»	»	9	»
2	»	»	9	»
1	»	»	15	»
0	»	»	25	»
			76	families

Seventy five of these families have been examined as carefully as possible. Only one family has been prevented from appearing for examination.

Tuberculosis in some form or other has been found in 61 families out of the 75, giving a percentage of 81.88 %.

Out of the 14 families in which no tuberculosis has been found, only 9, however, have undergone a thorough examination, one or more members of the remaining five families having been unable to appear for examination. Thus only the afore mentioned 9 households can with certainty be regarded as free from tuberculosis.

The examination showed that the size of these 9 families was as follows.

7	members	in	1	family
5	»	»	1	»
4	»	»	1	»
3	»	»	1	»
2	»	»	2	families
1	»	»	3	»

The remaining 61 families have thus shown signs of tuberculosis in some form or other among their members. —

There were:

Tuberculosis in lungs (or doubtful cases)	in	19	families
» » glands	»	15	»
Both » » » and lungs	»	27	»
		61	families

A fact especially worthy of attention is, that within this district where tuberculosis in lungs and glands seems to be enormously spread, other forms of tuberculosis are very seldom found. At the last examination at Antnäs one case of gonitis was dingnosed.

Another fact equally worthy of attention is, that according to an investigation recently commenced, bovin tuberculosis seems to be entirely absent from the district. (Le Bulletin de la ligue Nationale etc. pour la conf. à Vienne 1907).

SANATORIUM TREATMENT AT HOME.

BY

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MEDICAL SUPERINTENDENT AT THE ÖSTERÅSEN SANATORIUM.

THE DIRECTIONS given below are intended for consumptive persons who are waiting for admission to a sanatorium and for those who from one cause or another find themselves obliged to have recourse to a home treatment in lieu of a more perfect one at a sanatorium. *

The treatment of patients for consumption has two main aims: —

1) To restore the patient to health, and

2) To prevent the spread of the infection.

To begin with, we will briefly point out the measures that should be adopted in the home for the attainment of the last-mentioned object. Before doing so, however, we must say a few words about the views now held regarding the ways in which infection is carried from a diseased to a healthy person.

There are two factors necessary for giving rise to and developing consumption: — The individual must be exposed to the germs of the disease, the so-called *tubercular bacilli,* and he must be susceptible to the poison.

A healthy adult person is by nature endowed with a great resisting power against the bacilli, which fortunately do not therefore often succeed in developing in him. On the other hand, anyone whose health, from one cause or another, has become impaired is thereby rendered more susceptible to the disease and is liable, if still exposed to infection, to succumb. An increased susceptibility

* Treatment in the patient's own home can never be so satisfactory as residence at a sanatorium.

of that kind may be congenital; it may, however, also arise as the result of some illness which impairs the health and strength, or as a result of bad habits, of unsatisfactory conditions of life, of deprivations and hardships of one sort or other, or of work which is either deleterious to the health or excessively hard, etc. An excessive indulgence in strong drink is often the indirect cause of consumption.

Children are very susceptible to tubercular infection under all circumstances.

The tubercular bacilli enter the human body with the air which we breathe or with the food which we eat. The principal source of infection is *the matter expectorated by consumptive people.*

The tubercular bacilli in the phlegm expectorated by a consumptive patient are disseminated all around in several ways. In coughing, in sneezing, or when talking loudly, the consumptive patient emits numerous fine invisible particles of sputum, which may contain living tubercular bacilli. If the diseased person is not careful to observe certain precautions, and allows the sputum to soil the furniture, the walls, or the floor of the rooms he inhabits, this, when dry, may be distributed far and wide in minute particles among the dust. As several series of investigations have proved, children creeping about on the floor of any room soiled in that way, often shelter tubercular bacilli under their nails, and the risk they then incur is patent when it is remembered how ready children of that age are to put their fingers in their mouths to suck them. It is known, too, that flies are often instrumental in spreading germs of various diseases.

From the above it is sufficiently clear how essential it is for the consumptive to strictly observe the following rules: —

1. *When coughing, clearing your throat, or spitting, always hold your hand or pocket-handkerchief close to your mouth, — and cough as quietly as possible.* Consumptive patients who cough a great deal ought to change their handkerchiefs at least once a day, and wash their hands frequently, especially of course previously to any meal. The handkerchiefs when dirty are to be kept moist in a suitable vessel, preferably furnished with a lid. The soiled linen

of a consumptive should be kept apart from that of the rest of the family and be thoroughly boiled by itself for a full half-hour, or in some other way disinfected.

2. *Always employ, whether confined to bed or up and about, an expectoration-cup* (with a lid to it in the summer, on account of the flies), *or else an expectoration-flask containing water. You should, consequently, never expectorate on to the floor, into your handkerchief, on to the street, the ground, or anywhere else, but into the expectoration flask or cup.* The contents of the expectoration cup or flask should be emptied every day either into a newspaper, which is then to be folded up small and burnt, or down the drain, if such one exists. If the secretion is copious, it should be boiled for ten minutes in a covered pan which must be kept specially for this purpose. If the expectorated matter is thick in substance, a pinch of raw soda should be added to it before it is put on to boil. The empty expectoration flask or cup should be rinsed first with hot water and then with a solution of lysol (a full teaspoonful of lysol to two thirds of a pint of water).

3. *Keep your house as free from dust and as clean as possible, and always damp the floor before sweeping it.* Always remember the possibility of your children contracting infection while playing on the floor if that be not clean. A consumptive patient should have a room to himself, if possible, and under no circumstances should he share a bed with anyone else. He must never live in a family where there are children.

As sunshine and a plentiful supply of light are capable of killing infectious matter, or, at any rate, of checking its development, you should try and procure, for that reason alone, *a sunny, airy, and commodious dwelling.*

4. *Do not let anyone else use the same plates, knives, forks, and other eating utensils as yourself. After use, your implements should be carefully washed by themselves with soft soap in hot water.*

If these measures of precaution and cleanliness are carefully and thoroughly observed, consumptive patients do not run the risk of infecting those about them. Consumptives who do not expectorate are not dangerous either to those around them. We hope

that in a not too far distant future people will learn to feel perfect security and confidence in the presence of those consumptive persons who use the "blue expectoration flask", and that, on the other hand, those who are in the habit of spitting freely about, with a total disregard of other people will be rigorously dealt with. It cannot consequently be too emphatically asserted, that *the dread which the public at large often shows towards those who have treated at a sanatorium, and towards such consumptives who have adopted and are conscientiously following out the above-given rules is unwarranted and unjustifiable in a high degree.* It is easy to realize what a paralyzing influence this exaggerated *dread of bacilli* must have upon the efforts of victims to the disease to earn their own livelihood, how it must restrict the possibilities for them to obtain employment, and how much it must detract from the pleasure they might otherwise still have in life.

No medicine has yet been found which is capable of curing consumption, nor has any method of treatment been devised which has any direct effect upon the bacilli themselves. The treatment which, at the present stage of scientific investigation, is regarded as being the most efficacious is *the sanatorium treatment.* The idea underlying this is an arousing or strengthening of such healing power as is inherent in the constitution of the patient; the process, consequently, consists of a checking, in the first place, of the progress of the disease, then a healing of the diseased parts of the lungs by the formation of scars and, finally, a perishing of the bacilli in the scars.

Respecting the time requisite for checking the disease, experience shows that, if it is desired to make sure of having laid the foundation of a permanent cure, as much as half a year at least will as a rule be required. However, it does not necessarily follow that the patient will have to remain entirely inactive during the whole of that time. In many cases work may be resumed to some slight extent towards the close of the cure.

In order to restore the diminished powers of the patient and to set up the healing process, the means employed in sanatorium-treatment are remarkably simple, consisting of fresh pure *air* and sunshine, invigorating *diet,* and *rest,* together with a certain carefully regulated amount of *exercise,* and suitable *treatment of the skin* rubbings with a wet towel and showerbaths. The diseased individual as well as the diseased lung, are to be *spared* but also *hardened* and gradually *exercised.*

LET US PASS ON now to the application of the sanatorium treatment to consumptives in their own homes: —

The patient cannot be left entirely to look after himself; he must be put under the supervision of a doctor. A physician's help must be resorted to whenever any change for the worse is noticed in the patient's condition, and also for periodical examinations of the patient's lungs.

The patient must clearly understand, first of all, that it is of great importance to commence the treatment at as early a period as possible, for the prospects are then greatest of successfully remedying the evil, and the healing process is then more rapid.

Supposing that you are apt to feel tired from your work, are losing strength, or if you find that you are losing your appetite, that you feel discomfort after taking food, are troubled with a cough, stitch in the side, shortness of breath, or perspiration at night, or if you fancy you have got influenza, and when this state of things continues for some time, do not try and persuade yourself that it will soon be all right, but go to the doctor and find out whether you are suffering from consumption or not. The same advice is applicable, if you are often subject to what called "slight colds" and more especially if, when apparently in full health, you should get an attack of bloodspitting a thing which so often is a sign of chest trouble. Remember that you may go about for a long time with the seeds of the disease within you without ever feeling yourself ill in the ordinary sense. There are many who by forgetting this have had occasion to bitterly repent having let the time slip by when it was still possible to check the disease and there are

many too who, in ignorance of the nature of the complaint, have failed to observe the necessary precautions and as a consequense thereof have infected one or more of those nearest and dearest to them.

As soon as you have been told by your doctor that you are suffering from consumption, you must at once give up all your work so far as that is possible, unless your doctor should give you definite orders to the contrary. You are, remember, under these circumstances in the *utmost need of repose for both body and mind.*

BREATHING. You should always *breathe through the nose.* If you have a difficulty in doing so, consult your doctor, who will be able probably to remove the cause. When the consumptive cure has been proceeding for a couple of months, the patient should have acquired the habit, even when sleeping, of breathing tolerably deeply but quietly, and should therefore never need to dilate or strain his chest.

COUGHING. Coughing is a good thing for the consumptive patient if the phlegm is thereby easily brought up. Secretion from the chest often comes up into the pharynx without the aid of any cough and may then be removed by a slight clearing of the throat. A hard, violent coughing, on the other hand, is injurious, and dry coughing is of no advantage at all. It is dangerous to swallow expectoration brought up by coughing. The patient who makes use of his will, can succeed by degrees in getting the master of his cough, it being possible for him to remove the secretion from the diseased lung by means of gentle clearings of the throat. A visitor at a sanatorium is often astonished at hearing so little coughing. It is only in case the cough is so violent that it cannot be checked by voluntary effort that medicine should be used, to allay it; even then care should be taken not to prevent the removal of mucus from the lungs and not to administer more of the medicine than is absolutely essential. If *spitting of blood* occurs, to however small an extent, the patient should take to his bed and keep perfectly quiet (not even talk); the doctor, who must be summoned, will give further directions.

FEVER. It is highly important to know whether the patient has any fever or not, in order that suitable directions may be given him as to how he is to act. *The temperature is taken with* a properly adjusted, clinical thermometer introduced *at the rectum*.

At first the temperature should be taken several times a day, viz. *early* in the morning *as soon as* the patient wakes — though as nearly as possible at the same time each day —, half an hour after the midday meal, at six o'clock in the evening, and at nine o'clock at night. Should you not have been ordered to spend the day in entire quiet, you must be careful to lie still on your bed or on a sofa for half an hour immediately before taking the temperature. If for a space of several months the patient's temperature has been normal, it is not necessary to go on taking it regularly, but only if he feels hot or at all out of sorts, or if he has over-exerted himself. Complete freedom from fever, it should be noted, provided the temperature remains even, denotes that the process of disease has been arrested and that anyone who has been allowed to go walks or commence work can be sure, that he is able to stand the exercise he is taking or the work he is doing. It is for the doctor to determine at what time the patient may be considered free from fever, the "normal" temperature being different for different persons. A person living a "sanatorium life", may very often find that his temperature goes down to 36° C. or 36.2° C. (96.8° or 97.16° Fahr.) in the morning and is 37.2° C. or 37.4° C. (98.96° or 99.32° Fahr.) after the midday meal. In the case of women, however, the temperature is often markedly higher for a week or two previous to the menses than at other times; it should not however in any case exceed 37.6° C. (99.68° Fahr.).

If a patient is at all feverish, he should go to bed and summon the doctor. Complete rest for body and mind, fresh air, and a sufficient amount of nourishing food are the best means we at present know for removing fever. When the patient has at last got rid of his fever, after having had it for a longer period, he should still remain in bed for another week and not take any walks during the next month.

DWELLING-PLACE. If you have an opportunity of doing so, take up your residence somewhere in the country *in a dry not too hilly and not too windy place near pinewoods.* The sun has a beneficial effect upon the body and purifies the air; the air breathed must not be contaminated by smoke or dust. Your dwelling-house, consequently, should have plenty of sun i. e. face the south, and it ought not to be damp or draughty.

If you live in a town and it is impossible for you to move into the country, *you should at any rate arrange not to live in a narrow street nor on the ground floor nor with an outlook on to a confined courtyard.*

The patient who is obliged to remain in town should, if possible, procure a dwelling on the outskirts of it, where the air will be purer and the woods nearer at hand. In order that "the fresh air cure" described below may be carried out tolerably thoroughly in the wintertime, it is essential that the patient should have a room to himself. In the daytime one or more windows should be kept more or less open, in proportion to the outside temperature and the degree to which the patient has accustomed himself to a fresh air life; at night, one window should be kept ajar, unless it is very cold outside. An average temperature in the room of + 8° C. (46.4° Fahr.), or even still less, will do no harm. If it is felt to be too cold during the day, a fire must be lighted in the room. If the outside temperature in the evening is very low, the room should be thoroughly warmed by a good fire after the patient has left it. The windows should be kept closed while the fire is burning but opened again afterwards, to be closed once more shortly before the patient goes to bed, and they should remain closed through the night, the register and the flues of the stove, however, being left open. If it is impossible for the patient to procure a room to himself, he will have to content himself with airing the room thoroughly several times a day.

By carrying out the above-described efficacious ventilation in the wintertime, you not only obtain fresh air indoors, you get cold air too, which at that season is *a necessity,* since, by reason of the great difference existing between the outdoor and indoor temperatures,

people on going out are very liable to catch cold and thereby contract acute catarrhs in the upper air-passages (nose, larynx, throat, and windpipe). These catarrhs often increase the lung trouble.

During the warm season of the year the windows in the room should stand open day and night.

In the dwelling-house the utmost cleanliness should be insisted upon; everything that can occasion and promote the formation of dust should be removed, no unnecessary receptacles of dust should be tolerated in the patient's room. The floor should be covered preferably with linoleum, all other species of covering, such as carpets, being deleterious. Sweeping and dusting should be exclusively done with a moist rag or cloth. A consumptive patient should on no account remain in a badly ventilated, hot, dusty, or smoky room.

Provisional shelter for the lying-down cure.

CLOTHING. The clothes a patient should wear must be adapted to the temperature of the season. It is not good for the patient to feel cold, but should he neither have so much on that he gets into perspiration either when sitting still or walking about. In case he gets into a perspiration, he should at once change his under-garments and rubb his skin thoroughly dry. Next the skin

wool should be worn (in summer, of course, of a thin texture, or, still better, it can then be exchanged for cotton); undergarments should be changed frequently. No garment worn should be so tight that the movements of the chest are thereby impeded.

Provisional shelter.

TREATMENT OF THE SKIN. Great care must be taken to keep the skin clean, the hands especially requiring frequent washing; the neck and chest should be washed with cold water. The teeth should be brushed thoroughly both morning and evening; decayed teeth must be attended to by a dentist. Rinsing of the mouth should be done frequently, particularly after every meal. A hot bath (35°C., 95° Fahr.) of ten minutes' duration should be taken, if possible, once a week at least; after the bath the body should be immediately sponged all over with cold water and then thoroughly dried. The bath should be taken in the evening just before going to bed. If feverish the patient must not take a bath, but wash the body all over every evening with tepid water. A cold sponge all over for a patient who has been free from fever for a considerable time and is not liable to blood-spitting, is a good means of invigorating and hardening the body; it should not however, be resorted to except under a doctor's advice. Out-door bathing is not permissible.

THE LYING-DOWN CURE. The object of this cure is to provide the patient with as much pure, fresh air as possible, without his being required to take any exercise. During this time the patient should enjoy entire *rest* both in body and mind. He should find a spot to lie down at on a dry wooded slope among pines or, if the condition of the weather or any other cause prevents that, he should lie close to the open window in his room. He must be sheltered from any keen wind, especially from the North, and should be so placed that plenty of sunlight may reach him, though without incommoding him; he, consequently, should be looking towards the South. He should have a comfortable reclining-chair, in which he can take his meals without effort, and from which he can easily reach any thing he may need during the course of the day. He should lie on his back; in summer-time his chair should be exchanged for a hammock, so arranged that his shoulders are not compressed; in favourable weather he might lie on a rug on the ground. In the height of the summer, when it is very hot, a shady place is the best. A suitable *shelter for the lying-down cure* can easily be constructed: — a little shed, the front side of which is left open, is erected of planks; in the back wall a window should be made; the size in each direction should be a little more than three yards. This provisional shelter, the appearance of which is rendered plain by the cuts on the preceding pages, is to be erected facing the south or south west on a piece of dry ground well protected from the wind; the ground inside should be laid with gravel.

WALKS. A walk should not be begun until at least half an hour after the meal. As to the length of the walk the patient must take the advice of his doctor. Just as walks at too early a stage of the treatment, or if indulged in to excess, will induce a deterioration in the patient's condition, too much lying down or too lengthy a period in a recumbent position can check progress towards recovery. At first, however, on beginning his walks, the patient must proceed with the utmost caution, contenting himself with a walk of from fifteen to twenty minutes three times a day, to be extended very gradually. During the first few months of the cure

the patient should only walk on a level road; he must *walk slowly* so as not to get into a stage of perspiration, get out of breath, or be attacked with palpitations of the heart. As soon as the least sign of weariness is noticed, he must at once stop and rest. On receiving permission to extend his walks, the patient must be careful not to go so far that he cannot manage to get home without being tired; when he is permitted to go up hills (which should not be too steep), he should do so on his way out and not on his return when he is likely to be more tired. As soon as the patient has become accustomed to being out in the open air, nothing save a strong wind, heavy rain, or a snow-storm need compel him to stop at home.

DIET. The regularity which must characterize the daily life of the patient both during the progress of, and after the cure, must also be observed in respect to his meals, which are to be taken at fixed hours and in the utmost attainable peace and quiet. The food should be masticated thoroughly, so that the work devolving upon the digestive organs may not be unnecessarily increased. An invalid who has grown thin must bear in mind the necessity, at any rate in most instances, of his increasing in weight until he weighs four or five pounds more than he did when he was well. Consequently, if his digestion is in good order, he ought to eat a certain amount more than he feels inclined to. If, in spite of the fresh air life his appetite refuses to return, or if he is inconvenienced by the food he takes, he must consult his physician. The diet should be *wholesome and simple and with plenty of variety* and, at any rate as long as the weight of the body is unsatisfactory, food should be taken four or five times during the day with equal intervals between each two meals. Between two and three pints of unskimmed milk should be taken per day at meal-times, though not more than one or two glasses at each meal. Fatty and farinaceous foods are very suitable. Oatmeal gruel or porridge should be taken in the morning in preference to coffee. *Beer and wine must only be taken on a doctor's orders,* and all other strong drinks must be entirely abstained from. It is very important that the

diet should be as varied as circumstances permit and that it should be prepared and served in the most appetizing way possible. An observance of this rule will often act as a stimulus to a failing appetite.

RULES FOR THE DAY. Anyone who has been ordered by the doctor to keep his bed, should only leave it for the brief interval necessary for making the bed; the toilet should be performed and meals partaken of by the patient in a sitting posture in bed. For a patient who has received permission to be dressed during the day but who is to remain lying down and not to go out of the house, the same rule holds good, except that in performing his morning toilet he may sit on a chair (must not consequently stand up). Other patients must spend the day-time in lying down, going walks, and taking their meals in due sequence; the periods for lying down should immediately precede meal-times.

The following is *a suggested rule for the day* for patients in full cure: —

7 a. m.	Getting up.
7.30 a. m.	First meal. Oatmeal gruel or porridge with milk.
8—9 a. m.	Walk.
9—10 a. m.	Lying down cure.
10 a. m.	Breakfast: bread and butter with slices of cold meat, etc., milk; a couple of eggs or a warm dish.
10.30 a. m.—12 noon.	Walk.
12—1 p. m.	Lying down cure.
1.30 p. m.	Dinner: two warm dishes; milk or water to drink.
2.30—4 p. m.	Lying down cure.
4 p. m.	Afternoon meal: coffee with rolls or rusks.
4.30—6 p. m.	Walk.
6—7 p. m.	Lying down cure.
7. p. m.	Evening meal: bread and butter, cold meat, etc., milk, porridge (oatmeal, barley, semolina, or rice).

7.30—8.30 p. m.	Lying down cure.
9. p. m.	Bedtime.
9.15 p. m.	Large glass of milk (in winter-time hot).

The patient must eschew all parties and similar entertainments and also games, especially cards and chess. At what stage and to what extent he may be allowed to employ himself with light reading or writing his doctor must determine.

AFTER-CURE. After the patient has completed the cure proper in the manner and for the time which may be necessary, and has received permission to return to his work, he will have to prepare himself for undergoing *the after-cure, which is no less important than the cure itself.* It is to be remembered that half a year's stay at a sanatorium, even with a case that has been taken in hand early, is only capable of laying the foundation of checking the disease and bringing about the beginning of an improvement in the state of the lungs, whereas the ultimate aim, viz. the complete removal of the illness and the recovery and maintenance of the patient's power of work, can only be attained permanently as the result of a couple of years' care and caution. In other words, it is by no means sufficient to *feel* restored to health. The convalescent, on returning to work, must see that fresh air prevails in his place of work and his home, must be careful to take his meals at fixed times, get a sufficiently long night's sleep, obtain time for a walk, at any rate in the evening, and make arrangement for a brief period of resting before and after dinner. Work should only be begun gradually, and last from three to five hours a day; the strength must be tested to see what the patient can stand, all over-exertion being rigorously avoided; the doctor's advice should be regularly resorted to. A consumptive patient who has successfully carried out the cure must do all in his power to keep up his strength and ability to resist disease for the rest of his life. He should, consequently, lead an "exemplary life" in every way, and try to obtain for himself the best possible outward conditions of existence; moreover, whenever any ailment comes upon him of whatever kind it may be, or if his weight is found to decrease

(he should be weighed once a month), he must at once consult his doctor. A recurrence of tuberculosis is very often solely due to the fact that the person in question can or will not carry out the advice given him regarding the after-cure, by reason either of ignorance as to the peculiar nature of consumption, or of unfavourable outward cirumstances (poverty, unhealthy dwelling, occupation deleterious to health, bad habits etc.).

THE SWEDISH NATIONAL ANTI-TUBERCULOSIS ASSOCIATION.

PROGRAMME.

The task that the National Anti-Tuberculosis Association has before it is *to combat by every means in its power the tuberculosis among the people at large in the country of Sweden.* The Association desires to set about this task in cooperation with local associations working for the same end, and with private individuals who are prepared to devote time and energy to the question, both by endeavouring to take measures for preventing the spread of tuberculosis in the country and by directing and organizing the most practical means of caring for those affected with the disease.

It is principally that form of tuberculosis ordinarily called *consumption* or *phthisis* to which the Association devotes its attention. It is the intention to spread a knowledge of the disease among the public at large, and more especially among those members of the community who, by reason of the circumstances in which they live, are more liable than others to contract the disease. It is of the first importance that the working classes both in town and country, should grasp and appreciate the necessity of observing the laws of health in order to avoid consumption, and that the great mass of the people should acquire an understanding of the nature of the disease and be instructed as to the ways in which it spreads, and receive instruction as to what can be done to prevent the spread of infection.

The methods for carrying this into effect are: — The publication of *pamphlets on tuberculosis,* the giving of public and private *lectures*, the holding of *courses of instruction and classes* for teachers and other persons who are sufficiently well equipped intellectually to be able to impart to others the knowledge which they may thus gain regarding the disease. The cost of this branch of the Association's work will be borne, partially or entirely, by the National Association.

With these ends in view it is desirable that the Association should possess *a library* of the principal modern works on tuberculosis and also *a museum* containing suitable exhibits for promoting the practical study of hygiene.

If the Swedish National Association can get into touch with Anti-Tuberculosis Associations and other institutions of a similar character abroad, the experience gained there should be utilized for the needs of this country. Within Sweden itself, the extent to which the disease is prevalent must be carefully recorded, *statistical enquiries* being made from time to time.

Travelling allowances may be granted by the Association to suitable persons, to enable them to take cognizance of new departures in the treatment of tuberculosis, to study new methods in the struggle against the disease, or to give those persons an opportunity of attending congresses or meetings where the question of tuberculosis may be expected to form an important subject for discussion.

An interest in the struggle against tuberculosis as a national disease is aroused, spread, and maintained by the methods above stated, and also by keeping the matter constantly before the public *through the agency of the Press.* The assistance of the Press is requisitioned to interest public opinion in favour of the objects the Association has in view.

The Association confidently trusts that any influence its members may possess in public administrative bodies capable of giving financial aid and other grants, will be exercised on its behalf, to the end that *the public may be induced to adopt vigorous and practical measures* for averting the dangers of tuberculosis.

As regards *legislation* against tuberculosis, the Association proposes to urge the passing of any measure brought forward, if it can be shown to be of real value and not one unduly restricting personal liberty, or inflicting such hardships upon the patients suffering from the disease as would be calculated to make their existence still less endurable than at present.

Councils parishes, employers of labour, or private individuals, that may desire to institute *nursing homes for those suffering from tuberculosis,* or that may meditate adopting other measures to check the disease, can obtain from the Association free of charge, counsel, information, and support in their efforts, the Association placing its experience and influence at their disposal for the realisation of the plans they have in view. In special cases, where the financial resources of any particular parish do not allow of the carrying out of expensive measures, which would nevertheless be highly desirable for the public health, the Association may offer pecuniary assistance to cover some portion of the expenses.

Generally speaking, it does not belong to the functions of the Association to erect or maintain at their own cost sanatoria, homes, or other nursing institutions, which it is generally held should devolve upon the State, the County Council, the parish or the employer of labour. On the other hand, the Association may start, wherever needed, model or experimental hospitals and, in general, take the lead in the application of new methods adapted for combating tuberculosis, more especially in cases where it appears probable that possibilities may thereby present themselves for waging war with the disease by methods corresponding to the economic conditions of this country.

Donations made to the Association for a definite stated object shall be administered by the Association free of charge in exact agreement with the design of the giver.

The task the National Association has set before itself is, to endeavour to rally *all* classes of society to carry on in the name of humanity an organized and untiring struggle against tuberculosis in Sweden, in the confident assurance that in this, as in other things, »union is strength» and that unity will lead to victory.

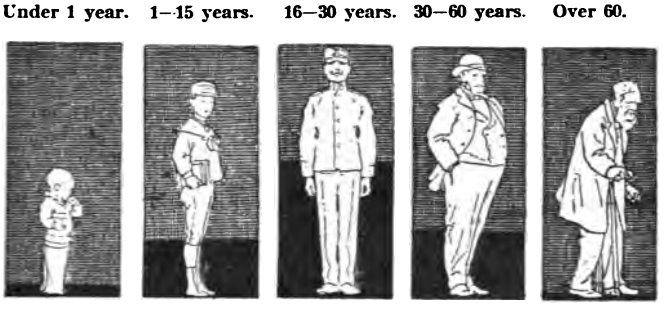
STATEMENT

ISSUED BY THE SWEDISH NATIONAL ANTI-TUBERKULOSIS ASSOCIATION.

Tuberculosis is a very widespread disease which makes its appearance in a variety of forms, tuberculosis of the lungs (phthisis or consumption), tuberculosis of the glands, of the bones, of the joints, of the brain, etc.

Of all these various forms of tuberculosis in man, *consumption* is the most common.

In Sweden there are no less than 30,000 people suffering from this disease, and at least 10,000 die of it every year. Most of the cases of death occur in people who are *in the prime of life.*



Out of 100 cases of death in each of these groups, tuberculosis is responsible for 4 in the first, 23 in the second, 53 in the third, 25 in the fourth and 1 in the fifth group.

Tuberculosis is an **infectious** disease. The infection is conveyed principally through **the sputum of a consumptive patient,** for this contains the germs of infection, the so-called tubercular bacilli.

Almost every human being is exposed to tubercular infection, but fortunately the tubercular bacilli are not always dangerous. In bright, sunny, well-ventilated rooms, where everything is kept clean and sweet, they soon lose their power.

On the other hand, it is injurious to be constantly and for a lengthy period of time in contact with a consumptive patient who does not observe every precaution with regard to his or her sputum; the infection becomes particularly perilous in dark, close, badly ventilated or dirty rooms or workshops.

Children are very susceptible to tubercular infection. They are very liable to catch tuberculosis in some form or other, and should therefore be very carefully looked after in every home where there is anyone living who has a weak chest.

The spread of tuberculosis can be successfully combated, and it must be combated.

Grown-up persons can easily protect themselves from infection if they live sober and regular lives, and provided that any consumptive in whose proximity they may be living or working, is careful to cultivate scrupulous cleanliness and to take every precaution with the sputum coughed up. There is no occasion for any grown-up person to feel afraid of a consumptive person who is particular in the above-mentioned points.

Never allow anyone to spit on the floor in your house or in your office or workshop.

A consumptive person should always use a sputum flask or cup, which must be thoroughly cleansed every day with boiling water. The matter expectorated must be destroyed in some thoroughly efficient manner, either by boiling it or by mixing it with a solution of lysol (one full teaspoonful of lysol to a third of a litre of water), or else by burying it in the ground.

Keep your children thoroughly clean, especially their faces and hands. Be careful that the milk, as well as all the food which they are going to have, be not contaminated by the sputum coughed up by consumptive persons. Never take any consumptive person as lodger in a home where there are children.

Clothes, linen, and those articles which a consumptive has worn regularly, should be disinfected very carefully before they are given to anyone else to make use of. Things which cannot be thus treated ought to be burned.

Consumption is a serious disease it is true, but is *not* incurable. Everyone who is afflicted with a protacted or recurrent cough, or has any other sign of a chest complaint, should at once consult a doctor and follow out very carefully the advice which he may give.

THE SWEDISH NATIONAL ANTI-TUBERCULOSIS ASSOCIATION.

ADVICE TO CONSUMPTIVES AND THEIR SURROUNDINGS AS REGARD PRECAUTIONS TO BE TAKEN AT HOME.

1. *A consumptive patient should harden and strengthen himself and avoid exertion.*
   Sponge the body all over with cold water every day.
   Change clothes, socks and shoes on getting wet.
   Have a warm meal at least twice a day.
   Drink a great deal of milk but no ale or small beer, unless perhaps to meals and even in that case in very small quantities. Never take spirits of any kind.
   Use all leisure time for resting. Go to bed early.
2. *A consumptive patient should be careful to keep his body thoroughly clean.*
   Wash the face morning and evening.
   Use soap and water to keep the beard clean.
   Give hands and nails a good brushing both morning and evening, and also before every meal.
   Have a tepid bath at least twice a month.
   Rinse the mouth out with fresh water and brush the teeth night and morning.
   Do not swallow the sputum you cough up.
3. *A consumptive patient should be careful to protect those with whom he lives from infection.*
   Cough quietly and with closed mouth; when coughing, turn your head away so as not to cough on anybody who is present, or on food etc.
   Hold the pocket-handkerchief or the hand up to the mouth when the inclination to cough cannot be checked.
   Never share a bed with anyone.
4. *Never spit on the floor.*
   Use a sputum cup or spittoon in the house and always carry a sputum flask on you, so as not to have to spit into your handkerchief.
5. *Destroy the expectorated matter in some effective manner or other.*
   Burn it, boil it, bury it, or wash it down the sink or drain.
   Cleanse the sputum flask or cup with hot water or a soda solution every day.

6. *Observe precaution when handling the clothing, linen and eating utensils used by a consumptive patient.*
   Never allow anyone else to wear clothes belonging to a consumptive person, unless they have first been thoroughly disinfected.
   Give a consumptive patient a clean handkerchief every day.
   Keep the soiled linen of a consumptive patient in a special sack or bag and soak it thoroughly before counting it over or handling it; wash it in boiling soda solution.
   Wash the eating utensils, knives, forks, spoons etc., used by a consumptive patient, by themselves, and do not let anyone else make use of them.
7. *Have your house cleaned thoroughly at frequent intervals.*
   Do not dirty the floor with wet or muddy boots; have the floor scoured frequently.
   Have furniture, carpets, mats personal and bed-clothes turned out frequently to be aired, shaken or beaten out of doors.
8. *Never sweep without moistening the floor.*
   Put a clean damp duster round the broom-head.
   Burn the sweepings.
9. *Keep the air pure and fresh in living rooms and kitchen.*
   Do not be unduly afraid of draughts.
   Have your window open, or keep it ajar, as much as possible.
   Ventilate all bedrooms thoroughly, both morning and evening.
   Have the doors and registers of the stoves closed for a couple of hours after the fire has burnt down, but otherwise let them stand open both day and night.
10. *Be specially careful to protect children from infection.*
    They should be washed all over every day; mind that their hands and faces are kept clean.
    Do not let them get into the habit of sucking their fingers.
    Keep them from creeping about on dirty floors or stairs.
    They should on no account sleep in the same room as a consumptive patient.
    Invalids and strangers must not be allowed to kiss children.
    A consumptive mother must not nurse her offspring.

THE SWEDISH NATIONAL ANTI-TUBERCULOSIS ASSOCIATION.

ADVICE TO LUNG-PATIENTS WAITING FOR ADMISSION TO A SANATORIUM.

1. *Consult a doctor* and request him to examine you and study your state of health, with a view to determining which of the following rules are suited to your case, or to make any alteration in them that may be necessary for you.
2. Procure a *Dettweiler pocket sputum flask* (obtainable at a chemist's), and use it whenever you need to expectorate. The flask with its contents is to be cleansed in the following way: — Open the lid of the flask and then place it in a pan filled with clean cold water, which is then to be heated to the boiling-point and left boiling for ten minutes. The boiled water and the sputum, in which the infectious bacilli will have been killed and rendered innocuous by the boiling, are to be emptied down the sink or drain. The flask is then to be rinsed in clean water and dried.
3. When sneezing or coughing, *hold your pocket-handkerchief close to your mouth* so as nos to cough on anything around you.
4. *Wash your hands frequently* with soap and water.
5. *Take a clean pocket-handkerchief every day;* deposit the soiled one in a vessel — with a lid to it and containing some liquid, such as soap or soda lye — in which it should remain for some hours before washing.
   Do not unnecessarily touch your soiled handkerchiefs. Take care that your children do not get at them.
6. If possible, give up your ordinary work, *change your place of residence* and go to live in the country if you can.
7. Arrange to *live alone in a sunny room,* if possible.
8. *Take your temperature* morning, noon and night with a clinical thermometer (purchasable at a chemist's), to be inserted at the rectum for a space of five minutes.
   If your temperature is too high, that is to say, if it is above 37.5°C. (99.5° Fahr.), go to bed and remain there untill it has fallen to the figure named.
9. If your temperature is not too high, *you should go out for a walk in the fresh air* for a little while (say from fifteen to thirty minutes) immediately after every meal. Duration of walk to depend on your strength. Do not walk fast. Take deep breaths.

10. *Spend your time out in the open air.*
If for any reason you cannot do so, *keep your windows open* when you are indoors, as is the practice at the sanatoria, and *have your window open at night.*

11. In the middle of the day *take a good rest*, preferably in the open air, for a greater or less length of time (dependent upon the degree of your need of repose), but for at least two hours; the best time is after returning from your after-dinner walk. If you feel tired, do not forget to use the simple remedy for fatigue: *to lie down and rest.* Thus, you should rest more both at night and during the day than when you were well. Rest, for instance, for half an hour or an hour before every meal, so that, refreshed by your repose, you may have a good appetite for your food.

12. *Eat heartily.* Masticate your food well. See that you have your meals at regular hours, every three or, at most, four hours through the day. The following is a suitable arrangement for the day's meals: — At half past seven, oatmeal porridge and milk; at ten, bread and butter with slices of cold meat etc., unskimmed milk, a hot dish (e. g. fried herring or bacon and potatoes, a couple of eggs, etc.), coffee and biscuits; at one o'clock, a two-course dinner; at four o'clock, coffee and biscuits; at seven o'clock, rye-meal porridge made with water, unskimmed milk, and bread and butter with slices of cold meat etc. Oatmeal porridge and milk in the morning is specially recommended as very suitable for your state of health. A special diet in the ordinary sense is not in general at all necessary. Ordinary good simple fare, well cooked, is, as a rule, the very best. If your digestion is bad, or if there are some kinds of food you are unable to take, consult your doctor as to your diet.

13. Get up in the morning and go to bed at night at fixed hours every day. Divide your time, so that one day resembles another as much as possible. *Live a regular life.* Avoid parties, meetings and entertainments of every kind, otherwise your state may grow worse.

14. *Avoid every indulgence in alcohol, beer and tobacco.*

15. At seven o'clock every morning you should *wash your chest and back* with ordinary, fresh cold water and a little green soft-soap and then dry yourself with a coarse towel, going on rubbing until you are thoroughly warm.

Believe confidently that *tuberculosis of the lungs can be cured.* Many sufferers from that complaint before you have been restored to health. Do not be discouraged or depressed by the knowledge that you have contracted tuberculosis.

JOHN TILLMAN. EMIL WADSTEIN. C. E. WALLER.
Medical Superintendents at the Jubilee Fund Sanatoria.

THE SWEDISH NATIONAL ANTI-TUBERCULOSIS ASSOCIATION.

THE CONSUMPTION TERROR.

THE ENDEMIC disease which at the present day claims the greatest number of victims *is tuberculosis*. Therefore this disease demands more than any other the attention of all classes of people and calls for energetic measures on the part of the public.

Happily the feeling of the necessity of such measures is becoming more and more marked, and the systematic work of checking the disease is at present going on with great energy in our country just as it is in other parts of the civilised world.

But the combat which has only just lately seriously begun here against tuberculosis has, as might have been expected, brought with it a very unwelcome apparition known as the "*Consumption Terror*".

The trouble and harm which this has caused and the hindrances it causes to the individual as well as to the entire community in fighting the disease are becoming more and more apparent.

For instance, it is often difficult for the consumptive and his family to obtain a dwelling-house on account of the consumption terror.

Neither is it a rare occurrence that persons are deprived of all means of earning their livelihood simply because their fellow workmen or foremen suspect them to be suffering from tuberculosis.

Consumptives are often compelled to go without the necessary treatment because they fear to disclose the nature of their illness, whilst for the same reason many are prevented from adopting the precautions which are necessary for the prevention of the spread of the disease.

The consumption terror shows itself in many ways, and the difficulties and indignities that a consumptive has to put up with in consequense of the heartlessness, ignorance and cowardice of his fellow creatures, are often worse than the suffering which the disease itself causes.

Even public measures taken against the disease are rendered much more difficult on account of the unreasonable fear of consumption. For instance, several times it has happened that the erection of sanatoria, or other establishments for consumptives, has been made impossible because influential persons have opposed the building of such places in a district which was considered suitable for the purpose. Nor is evidence lacking that the authorities have tried to prevent the adoption of preventative measures against tuberculosis, although they were convinced of their necessity and expediency,

merely for the reason that the proposed steps would create an absolutely groundless terror of consumption.

Indeed, one can hear persons in responsible positions express the opinion, that it would be better to keep the public ignorant of the disease and let it continue its destructive work, than to awaken the fear of consumption by means of spreading information Innumerable other instances of this unreasonable consumption terror show that it is widely spread, and that it is harboured by educated and uneducated people of every social position.

The conspicuous characteristic for those who are attackad by this "terror" is, that without the least consideration, they endeavour to avoid everybody and everything that can be suspected of being affected with tuberculosis. They will not be persuaded that in modern society no one can absolutely avoid coming into contact with tubercular bacilli. Nor can they be made to believe that tuberculosis is only infectious under certain conditions. They dare not accept the fact that even bacilli are governed by laws which only permit them to develop their destructive activity under definite conditions.

It is the tuberculosis they see, or have a knowledge of, that terrorises them. They forget that the danger they know to be present is just that from which they are, to a great extent, protected, because it can be avoided. They do not seem to know that it is far more difficult to escape the dangers they know nothing of, and they do not understand that a helpless dread of all consumptives and of everything with which they have been in contact, can be of no service. They dare not rely upon the fact that, by means of conscientious and careful observance of the preventative measures which science and experience have taught, one is able to avert the danger of infection.

The dread of consumption has shown itself in many ways, and has become an enemy to society that threatens to counteract the campaign against tuberculosis. It must therefore be combated in every possible way and this is undoubtedly most easily done by teaching the public under what conditions and in what manner consumption becomes infectious. There are, it is true, many details touching this question which still are under discussion, but upon one point all scientific men agree, namely, *that it is the expectorated sputum of the consumptive and that alone, which carries the disease from one person to another.*

Various other illnesses, such as small-pox, measles, scarlet-fever, whooping cough, mumps etc. can be caught during a casual short meeting with an infected person. Such, however, is not the case with tuberculosis. For a person to be infected with tuberculosis he must be subjected to the attack of tubercular bacilli in great quantities and for a considerable time. And it must also be remembered that not all forms of tuberculosis are dangerous. Only certain forms have any significance in this connection. Tuberculosis of the joints, bones, glands etc., which is so common in children and is sometimes found even in adults, is not very dangerous for other persons. Neither is tuberculosis of the lungs under all circumstance infectious. It depends upon whether it is attended by a cough or not. Practically speaking, it is only the so called open lung tuberculosis with more or less abundant expectoration which can be said to play an important part in spreading the disease.

But by paying attention to certain precautionary measures, regarding which, information is given at the sanatoria and which can also be obtained from

pamphlets treating this subject, the person infected with open tuberculosis has it in his power to protect his fellow-beings from the bacilli he expectorates.

Besides it should be observed, that the human organism in a healthy condition possesses a great capacity for destroying the tuberculosis bacilli. Smaller quantities are quickly destroyed by the body's natural means of protection. For an adult to be infected by tuberculosis he must for a longer time be continuously working or living together with a consumptive who coughs and who is not careful with expectorated sputum. If the bacilli are to develop the disease, the person must to a certain extent be susceptible to it, or his power of resistance weakened from some cause or another, as for instance through other illnesses, overexertion, privation, reckless living or from other such reasons.

Thus no one need be afraid of casually coming into contact with a consumptive, nor of staying with persons suffering from tuberculosis who do not cough, or who neutralize the danger arising from their expectorations by using sputum flasks or cups. Such persons are far less dangerous than those who, in order not to disclose their disease, neglect precaution.

Excellent testimony as to the truth of the assertion, that tuberculosis is not very infectious for adults, may be found in the observation that consumption in the married state is seldom contracted by the husband from the wife or vice versa. Moreover in sanatoriums it seldom occurs that doctors or nurses become infected, or, at least, the disease does not attack more of them than could be expected to contract consumption if they were engaged in any other trying occupation.

The explanation of this is easy to find, and may be put down to the fact that in a well managed hospital if tubercular bacilli are coughed up, they are quickly destroyed. In such establishments, cleanliness, which is our most effective weapon against consumption, reigns supreme.

The above facts regarding the infectiousness of tuberculosis are, however, only applicable to adults. With reference to children and babies especially, our knowledge in this respect is more limited, but we know with certainty that they are extremely susceptible to the infection. Therefore it is advisable to endeavour to protect them as much as possible from all intimate connection with persons suffering from the disease. For this reason consumptive parents ought to mix as little as possible with their children and must be very careful in the home regarding the expectorations. Strangers with consumption ought not to be allowed to stay in the house where there are children.

In the struggle against consumption one ought, above all, to keep a keen, open eye for the real danger and to maintain against it a most resolute attack. Victory can only be won by the united, systematic cooperation of every helpful force.

Every one who realises this and who is willing to use the influence he possesses for the destruction of the most dangerous disease of modern society, must first learn to distinguish the important facts of the question from those which are unimportant or which even tend to paralyze the fight.

Unscrupulous and cowardly behaviour towards our unfortunate fellow-creatures who have fallen victims to this dreadede disease, is not only shameful but extremely harmful to the entire community. No one reaps any benefit from having made the unhappy consumptive's burden harder to bear. On the contrary, the sufferers ought to be encouraged by the confidence of the healthy and be thus enabled to gain courage to make every effort to conquer their disease and protect others from infection.

The consumption terror paralyses the struggle against tuberculosis.
The consumption terror prevents consumptives from taking care of themselves,
The consumption terror renders all measures against tuberculosis more difficult.
The consumption terror facilitates the spread of the infection.
The consumption terror causes us to overlook the real danger.
The consumption terror is a sign of shameful cowardice.
The consumption terror causes cruel behaviour to consumptives.
The consumption terror is an enemy to society that must be opposed.

THE CHARITY STAMPS, ISSUED BY THE SWEDISH NATIONAL ANTITUBERCULOSIS ASSOCIATION DURING THE YEARS 1904—1908.

BY

T. GELHAAR.

POST CONTROLLER;

MEMBER OF THE NATIONAL ASSOCIATIONS' MANAGING-COMMITTEE.

THE HONOUR of having invented the Charity Stamp must be given to America, »the land of inventions».

In the year 1862 the *first charity stamps* were sold at a great charity festival in Boston (Mass). These stamps, which were called Sanitary-fair stamps, were sold to benefit the wounded in the war then proceeding between the Northern and Southern States.

The idea was not adopted in Europe until 30 years later, when in 1892 Portugal produced the first charity stamps. (»Private Stamps for the Red Cross Society»).

A number of these stamps were what was termed »service stamps» and were available as ordinary postage stamps for the letters upon which they were affixed.

Post cards supplied with these stamps are also in existence.

During the years that followed most countries have endeavoured to obtain money for fighting disease — famine etc. in short, almost every social evil, by the sale of such charity stamps.

Germany and Austria have, during late years, instituted a special kind of private stamp, the so ealled »Wohlfahrtsmarken» the sale of which is intented to support objects or associations working for the welfare of society.

A list of some of the countries in which Charity Stamps have come into use and the date of their appearance is here given.

Switzerland (Lucerne)	1894
Australia (Victoria and New South Wales) Great Britain (Charity Stamps) and Uruguay	1897
France and Spain	1898
Denmark, Norway, Russia (Charity Postage Stamps) and Sweden	1904
Argentina, Austria, Finland, Germany, and Italy	1905
Baden, Bavaria, Zeeland, The Netherlands (Charity postage stamps), Poland, Roumania (Ch. p. st.)	1906
Switzerland (Neuchâtel)	1908

At the present time there are several hundred different types of charity stamps and »Wohlfahrtsmarken», of which about twenty are to be found in Roumania and thirty in Italy not including the so called »military stamps». About fifty are, or have been, in circulation in Germany and more than *three hundred* (300) in Austria or its dependencies.

A number of prints are attached at the close of this report as a sample of the different types of charity stamps issued by various countries.

On the 21st november 1904 The Swedish National Anti-tuberculosis Association decided to obtain means for the welfare of its work by issuing charity stamps.

Although the stamps were not to be considered as postage stamps or as having any postage value, the Association obtained permission from the government to sell the stamps in question through the various post offices throughout the country, by the assistance of Edward v. Krusenstjerna who was Post-master General at that time (died 1907). With his characteristic kindness of heart and foresight he saw from the beginning what great benefits would thereby accrue to the National Association.

PORTUGAL
(Brown and red)

SWITZERLAND
(Red)

GREAT BRITAIN
(Red)

AUSTRALIA (VICTORIA)
(Brown)

AUSTRALIA
(NEW SOUTH WALES)
(Gold, blue and red)

SPAIN
(Red)

DENMARK
(Blue and black)

NORWAY
(White and blue)

RUSSIA
(Violet and yellow)

ARGENTINA
(Black)

ITALY
(Black and brown)

ICELAND
(Gray and blue)

GERMANY
(Blue and brown)

FINLAND
(Red)

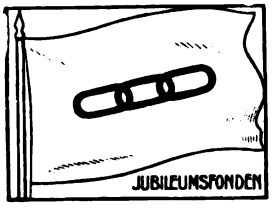
FINLAND
(Blue)

BAVARIA
(Blue)

GERMANY
(Blue)

BADEN
(Violet)

THE NETHERLANDS
(Light blue)



SWEDEN (I. O. ODD FELLOWS)
(Blue, white and red)

THE NETHERLANDS
(Red)

SWEDEN
(Blue and yellow)

AUSTRIA
(Red)

ROUMANIA
(Red)

POLAND
(Yellow and violet)

FRANCE
(Blue, white and red)

FRANCE
(Blue)

Despatching the new years' post with the assistance of the military at Stockholms General Post Office.

Permission for the sale of the stamps was given for one year at a time. They were to be affixed to the address side of letters, parcels and also post cards, and were to be stamped »according to the exigency of the work at the post offices». Similar permission was kindly granted by the postal authorities of Norway and Denmark.

The sale, which of course was greatest during Christmas and the New Year, continued throughout the year.

The sale price of the stamps was fixed at 2 öre (a little over half a cent) to enable persons in less lucrative positions to contribute their mite.

Ten per cent commission on the sale was allowed to the post office clerks.

All expenses connected with the manufacturing of the stamps were defrayed by the National Association.

The assistance of the Swedish press, the persevering work of the National Association and its provincial branches, the printed signs which were distributed over the whole country informed the public of the charity stamps which were shortly to be issued and of their purport.

As early as the 10th December 1904 the first Swedish charity stamps were awaiting distribution from our 3,000 post offices.

The result of the sale was magnificent. Six million, six hundred and seventy five thousand were sold of the issue of 1904, (of which one and a half million were disposed of in Stockholm) and the net profit falling to the Association amounted to Kr. 116,261 and 9 öre.

Type 1904.

Mr Th. Thorén was the designer of the stamp. The second charity stamp issued by the National Association (type 1905) appeared on the 1st December 1905, the namesday of the late Sovereign H. M. King Oscar II, and although the number disposed of was not nearly so great as during the preceeding year, the stamp bearing the portraits of the old and beloved Monarch and his Queen reached an issue of more than four million (Stockholm accounting for 745,000) realising a clear profit of Kr. 66,300.

Type 1905.

Type 1905.
(with overprint.)

Type 1906.

The celebrated artist V. Andrén designed this stamp, which was sold two years later with »6 June 1907» to celebrate the golden wedding of Their Majesties King Oscar II and Queen Sophia. The net profit resulting from the sale of this stamp amounted to Kr. 3,820, and was without reduction devoted to the fund for »The Sanatorium for Scrofulous Children».

During December 1906 was issued the National Associations' Charity Stamp »St George and the Dragon», which was drawn by Arthur Sjögren after his own proposal. The allegory of the stamp is very clear! The fighting and victorious St George is Science; the dragon signifies the destructive tuberculosis, whilst the figure of the woman kneeling in prayer, represents suffering humanity.

The idea was taken from a well known piece of sculpture of the middle ages, belonging to the Church of St. Nicholas in Stockholm.

In round figures about 3 million of these stamps have been sold (including 760,000 in Stockholm) providing a net profit of Kr. 47,100.

From year to year the National Association observed with regret the decreasing incomes resulting from the sale of charity stamps, and when it was realised how greatly increased the sale would be if the former charity stamps could be exchanged for others called charity postage stamps, which would thus possess postal and philatelistic value, propositions were made on several occasions during the years 1906 and 1908 with such an object in mind.

The temptation to adopt such a course became still greater when information was received from an authentic source stating, for instance, that the Roumanian charity postage stamps had brought in — entirely from a philatelistic point of view — more than Kr. 187,500 (about 50,360 dollars).

But although the Swedish Postal authorities had shown great courtesy in everything else connected with the stamps issued by the National Association the proposals made regarding a charity postage stamp met with their repeated refusals.

Under the circumstances therefore, the National Association had no other choice than to issue a new charity stamp of the ordinary kind; this time after the design of the aforementioned artist, Andrén.

The name of this charity stamp was »Charity and Medical Science» which together aim at reaching the temple of victory »the Sanity».

Type 1907.

The sale of the stamp was somewhat less than the preceeding year, but in any case it is said to have given a *net profit* of from Kr. 35—37,000.

The four different charity stamps have thus to the 1st of May enriched the National Association by about Kr. 265,000, which has been used in carrying out the Associations' humane object.

In order to secure as far as possible the most artistic as well as the most striking design for the charity stamp which it is intended to issue at the close of the present year, the Swedish National Association has arranged a *prize competition* with rewards of 300, 200, and 100 Kronor respectively.

The judges will be Mr Richard Berg, Artist; Mr J. G. Clason, Second Commissary and Mr C. A. Ramström, Civil Engineer.

Several other kinds of Swedish Charity Stamps are in existence.

For instance in the district of Elfsborg the local Anti-tuberculosis Association issued in 1905 stamps of three different values, 5 öre 10 öre (both blue and yellow) and also one for 50 öre (red and blue). These stamps are used partly to facilitate the payment of the Associations' annual fee, and are in such cases affixed to special forms or collection cards.

In the ordinary way the stamps are used as »seal stamps».

In 1906 a charity stamp was issued for »The Childrens Day in Helsingborg». Another was issued to commemorate the Jubilee of the Grand Lodge of Swedish Odd Fellows.

By special permission from the Swedish postal authorities, picture post cards of six different kinds and also private note paper and envelopes printed with the charity stamp are on sale at the General Post Office in Stockholm for the benefit of the National Association. The postcards cost 15 öre each, and the paper and envelopes 5 öre each.

The Swedish charity stamps have not been sold in Sweden exclusively, but have also been in demand abroad by stamp collectors.

For instance through the agency of kindly disposed and interested persons about 100,000 stamps of the 1905 type (bearing portraits of the King and Queen) were sent over to America, where buyers were not lacking.

It must by no means be imagined, from what has been said regarding the yearly decrease in the sale of charity stamps in Sweden, that the interest of the public in the tuberculosis question is on the wane.

Nothing could be more erroneous.

The ever restless spirit of charity only seeks other ways by which to reach her goal, the defeat of consumption.

Such, for instance, is the case with the association recently founded under the name of »The State Association of the First of May Flower». This society consists of an amalgamation of all the committees, which in different parts of the country, work to realise the idea of selling every year on the first of May a small artificial flower at 10 öre each (a little more than 2 $^1/_2$ cents), the money thereby obtained to be devoted to the struggle against tuberculosis. The flower is to be different each year and worn, so as to be visible, on the aforementioned date. The net profit for the present year must have amounted to Kr. 150,000 (including kr. 17,000 in Stockholm).

Then again the annual festivals called »The Children's Day» which are organised in the larger towns of the country may also be regarded as indirectly benificial to the tuberculosis movement, insomuch as the money thereby collected is used to enable poor children to visit the country during the summer, where the sunlight, fresh air and nourishing food replenishes them with health, strength and *increased power of resistance against the unavoidable bacteria.*

The annual festival in Stockholm alone results in something like a hundred thousand kronor. Besides all this, Parliament as well as towns and municipalities in Sweden, with ever increasing interest grant sums, running into many hundred thousand kronor; and further; consumption hospitals and sanatoriums are being erected in several places. These different measures constitute the struggle which is going on against the nations' most malignant and destructive enemy — tuberculosis.

The late King, Oscar II.

KING OSCAR II'S JUBILEE FUND

ITS ORIGIN, GROWTH AND ADMINISTRATION AT THE PUBLIC CONSUMPTIVES' SANATORIA 1900—1906.

BY

EMIL WADSTEIN, M. D.

MEDICAL SUPERINTENDENT AT THE HESSLEBY SANATORIUM.

IN MAY 1896 a number of prominent men in Sweden assembled together to discuss the most appropriate way of celebrating the approaching jubilee of the King's accession to the throne. It was thought that an expression of loyal affection and esteem in the form of a gift, to be subscribed to by the nation at large, would be best calculated to win approval and support among the majority of people,

and consequently shortly afterwards an announcement to that effect was drawn up and made public.

As to the way in which the money which might accrue from the subscription was to be made use of, nothing was determined in advance; it seemed most fitting that His Majesty should be allowed to decide upon that matter himself. In view of the ardent interest that both the King himself and his consort the Queen were known to take in the lot of those who are afflicted with either disease or poverty, it was to be expected that the gift would in one way or another benefit those members of the community who are less happily circumstanced than their neighbours.

In the month of September 1896 the Queen's attention was drawn to a description of tuberculosis and its ravages, and she was so moved with compassion at the sorrowful picture there painted, that she at once came to the conclusion that the struggle against the disease of tuberculosis would be an exceedingly appropriate object to which to devote the sum to be subscribed by the Swedish nation in honour of the King's jubilee.

The proceeds of the subscription were exceedingly satisfactory, as upwards of 2,200,000 Kronor* were collected in one year. The number of the subscribers (227,000) shows that the desire to contribute had not been confined to the upper classes, but had been very general too among those in poorer circumstances. Though the desire to make a worthy tribute to the King was doubtless the chief reason of the sum subscribed being so large, yet it is also certain that the interest people felt in the object to which the money was to be applied contributed not a little to increase the sums that the subscribers felt disposed to give. His Majesty had as early as 1896 made it publicly known that, in case the sum subscribed proved to be considerable in amount, he intended to devote it to the purposes of checking and curing tuberculosis.

On Sept. 18 1897, the 25th anniversary of his ascension of the throne, the gift was presented to the King by Count Gustaf Sparre, at the head of a deputation of the organisers of the collection.

About a month later a committee was constituted, under the pre-

* 1 krona = 0,268 $.

sidency of her Majesty the Queen, to carry out those preliminary inquiries which were essential for putting into effect the intentions of the King and his people in this matter. The other members of that Committee were: O. H. R. Printzsköld, Premier Court Marshal (deputy chairman), Professor J. G. Edgren, Professor K. M. Linroth, Dr. F. W. Warfvinge, Professor S. Ribbing, Mr. O. Jonsson i Hof, a Director of the Bank of Sweden, Dr. N. J. H. Englund, a District Medical Officer, Mr J. Philipson, a Merchant, and Dr. J. G. Rissler (secretary).

OTTO H. R. PRINTZSKÖLD,
Ph. D., First Court Marshal,
President of King Oscar II's
Jubilee Fund.

This Committee received their terms of reference in the form of a letter from the King, in which, among other things touched upon, he spoke of the urgent need there was for the erection of special sanatoria, to be called People's or Public Sanatoria, for the benefit of persons in poor circumstances who are suffering from consumption of the lungs, but in a form which does not preclude their recovery, or who are not at all events as yet so ill that their condition cannot be improved, who in fact by means of a course of treatment (a cure) at a sanatorium may be rendered once more able to discharge work. The letter went on to say — "No unnecessary expenditure is to be incurred on exterior ornamentation or on luxurious superfluities in equipment, a due observance of that being essential if, as it is hoped, these public sanatoria, the first of their kind in this country, are to be of benefit to as many sufferers as possible and prove really model institutions, not only in their practical usefulness but also in the relatively speaking reasonable cost at which they shall have been erected. If that end is attained, there is reason to hope that their existence will prove an incentive to municipalities, sick funds, and private associations to put up similar institutions at their own expense". Finally the letter stated that it was very much to be desired that the number of the public sanatoria should be at least three.

The various members of the Committee went very busily to work at their task and by February 1898 a complete plan had been prepared and could be laid before them, met in full conclave, for the erection of the intended public sanatoria, each of which was to provide accommodation for a maximum of 100 patients.

No less than 9 suggested designs for the sanatoria had been at that time handed in to the Committee, some prepared by the architects specially engaged to help them, some drawn by certain members of the Committee themselves. Though none of these designs were approved in all particulars, there was every expectation that out of these preliminary suggestions a fully satisfactory plan would be ultimately evolved as the result of further labour and inquiry.

It soon became apparent that, though the Jubilee Fund was very large, it would not prove sufficient for the erection of as many as three sanatoria, as had been from the first intended. The Committee therefore proposed in their report that only two sanatoria should be built at first, one in Central Sweden and the other in the northern part of the country, and that the building of the third should be postponed pending the increase of the capital by the accruing of interest on it year by year and by the addition of donations which it was supposed would be made from time to time to further the objects in view.

The estimate of cost for the erection and equipment of two sanatoria was 900,000 Kronor.

The up-keep fund for the two first sanatoria was put down at 1,200,000 Kronor.

As a reserve fund for the building of another sanatorium at some future date, 200,000 Kronor were set aside.

These items make together a sum total of 2,300,000 Kronor, that being the amount which it was expected would have been collected for the Jubilee Fund by the time the plan proposed could take practical shape.

Bearing in mind the very considerable area of Crown forests and the essentially national character of the enterprise in view, the Committee considered they were justified in assuming that the area

of ground required for the sanatoria would be placed at their disposal free of charge by the State or, possibly, by one or more private individuals. In that case the above-given estimate of initial cost of erection would of course be materially reduced and in proportion the time for the erection of the third sanatorium brought nearer, which was so much the more to be desired as that, the third, sanatorium was to be situated in southern Sweden where the population is much less sparse and scattered than elsewhere in the country. The calculations would of course work out still more favourably, if, besides ground free of charge, the institutions could have accorded to them the free use of wood for fuel from the Crown forests. In their report the Committee inserted a petition that the State would grant to the sanatoria free building-sites and 4,500 cubic metres of wood for fuel.

Meanwhile several members of the Committee had been travelling about the country with a view to discovering localities suitable in every way for the proposed sanatoria. The place first agreed upon as likely was the Hålahult Crown Forest Domain, in the Province of Nerike. The area of the domain is 518 hectares (1,280 acres); the trees on it are almost exclusively either pine or spruce and are of old and vigorous growth. It is situated on the southern declivity of the extensive forest tract in Central Sweden with miles of wooded country on all the sides from which shelter is specially needed. 93 % of the whole area is forest, 3 % is barren ground, and 4 % is occupied by buildings, etc. The southern slopes of a hill of 40 metres in height lent themselves admirably as a building-site and the ground all round afforded excellent opportunities for the construction of walks varied and undulating in character. The place is also easy to get at from the outside world.

As a suitable locality for the Norrland Sanatorium the Österåsen Plateau was suggested; it lies in the angle formed by two rivers and the natural scenery there is grand and entrancing.

In the immediate vicinity of the confluence there runs a flat, low-lying strip of land between 100 and 300 metres in breadth, and most of the houses in Österåsen Village are situated there. The land then

rises rapidly and steeply some 60 or 70 metres to an extensive and wooded plateau. The forest is of comparatively recent planting but shows vigorous growth; it consists of fir and spruce intermingled.

To the West and the North the plateau is fringed by tolerably lofty, wooded ridges of hills which form an excellent protection against the prevailing winds. To the South and East there is more open country, though sufficient shelter may nevertheless be said to exist there too.

It was stated above that the Committee regarded it as desirable for three sanatoria to be built, in order that patients might not have too far to travel to reach one of them, and that each of the three main divisions into which the country falls might be supplied with accommodation of this description in equal degree.

The estimates soon showed that with the means at the disposal of the Committee, it would be necessary either to rest content with two sanatoria for the time being and postpone the erection of the third until the 200,000 Kronor that were over had increased to 850,000 Kronor — the sum considered as the minimum for warranting the building of another — or to apply to the Riksdag for a special grant for the purpose. As the matter was so important the Committee decided in favour of the latter alternative and a proposition requesting a grant was brought before both Chambers of the Diet or Riksdag in March 1898.

It was intended that operations on the southern sanatorium and the Norrland one should commence at the same time.

As was to be expected, the Riksdag voted the sum without any dissentient voices being raised; they expressed the wish that in order to secure uniformity in administration at all three sanatoria the grant should be added to the Jubilee Fund and not be used solely for the third sanatorium.

Thanks to the generosity thus displayed by the Riksdag, the Committee considered it would do for them to recommend the commencement of the building of the third sanatorium, although prices of materials and labour had risen very much. The rise was indeed so considerable that the estimate of the total cost of one sanatorium

had to be altered from 350,000 to 480,000 Kronor, and hence the total estimate for all three sanatoria together with their equipment and maintenance worked out as follows: —

Cost of erection for 3 Sanatoria at 480,000 Kronor each	.....	1,440,000 Kronor
Equipment of 3 Sanatoria at 50,000 Kr. each		150,000 »
Maintenance » » at 600,000 » »		1,800,000 »
	Total	3,390,000 Kronor

While search was being made for suitable localities for the sanatoria in Central Sweden and in Norrland, inquiries had been instituted in Southern Sweden too for a suitable spot for the third sanatorium, but without success. Now there was more reality in the efforts to discover the right place, since the work of building was to commence at once, and on this occasion the search resulted in the Hessleby Crown Forest Domain being chosen as eminently suited for the purpose in view.

The domain is very extensive, being 750 hectares (1,850 acres) in area; it is almost entirely covered with conifers, principally pines. In the southern part, in front of the site intended for the sanatorium, the trees were of comparatively young growth, whereas behind the site of the house the trees were much older (about 100 years); still further north the trees were almost gigantic in dimensions and as much as 250 years old. The domain as a whole embraces a plateau 4 kilometres in length, which to the West slopes gradually down to the valley of the Bruså and to the East descends precipitously to the Silfverå.

On the southern declivity of the plateau there was found an exceedingly favourable spot, well sheltered from the North and East winds by a wooded hill about 40 feet in height and from the West wind by forest. The soil is everywhere the best that could be wished, consisting of gravel with a sufficient fall to admit of the surface water running away of itself and hence there are seldom any mists or early frosts. There is a fine extensive view from the top of the hill over the valley of the Bruså and over Mariannelund Village to the South, West and North.

The two rivers just mentioned and the lakes near by are not large enough for the climate to be in any way disadvantageously affected by them.

The sanatorium is comparatively easy of access from the outside world, for the railway station of Mariannelund on the Nässjö—Oskarshamn Line is only 2 kilometres off.

The plans and estimates were the same for both sanatoria, Hålahult and Hessleby. They were approved on Nov. 4 1898. The work of erecting the three institutions was pushed on as rapidly as possible and it was not long before the Hålahult Sanatorium was ready for inauguration. On the 13th of July 1900 the ceremony of opening this sanatorium, the first public one in Sweden, took place in the presence of the King and Queen, and proved a very memorable event. Three days later, on July 16th, the first patients, two in number, took up their residence in the institution, which was thus fairly launched on its beneficent career.

The opening of Österåsen Sanatorium took place on Aug. 2nd 1901 and that of Hessleby Sanatorium on Sept. 27th 1901.

In His Majesty's covering letter with the terms of reference to the Committee appointed to carry out the erection of the sanatoria, there occurred the following passage: — "It is incumbent that economy be exercised in every direction so far as is compatible with the attainment of that complete efficiency of equipment necessary for a rational and up-to-date sanatorium treatment of consumptive patients, and furthermore that no expenditure be incurred on luxuries pure and simple." Though this injunction was scrupulously carried out, the bill of costs nevertheless proved to be considerably greater than had been estimated. This may be attributed to two causes, viz. the desire really to equip the sanatoria in such a way as to make them thoroughly efficient and the very considerable advance in the price of labour and building materials that occurred while the work was proceeding.

Cost of Erection of Hålahult	.....	639,679 Kr.	21 öre
» » » » Österåsen	.....	735,661 »	36 »
» » » » Hessleby	.....	623,015 »	96 »
	Total	1,998,356 Kr.	53 öre

Cost of Equipment at Hålahult	55,241	Kr. 29	öre
» » » » Österåsen	52,315	» 52	»
» » » » Hessleby.....	49,900	» 85	»
Total	157,457	Kr. 66	öre

That makes a grand total of 2,155,814 Kr. 19 öre as against the original estimates of 1,440,000 Kr. for the building and 150,000 Kr. for equipment, or 1,590,000 Kr. altogether. That portion of the Jubilee Fund, consequently, which had been invested with the idea that the interest upon it would go a considerable way towards defraying the upkeep of the institutions, had been very much reduced and was by no means large enough now to render the future of the sanatoria secure, more especially as the charges for maintenance were rising continually.

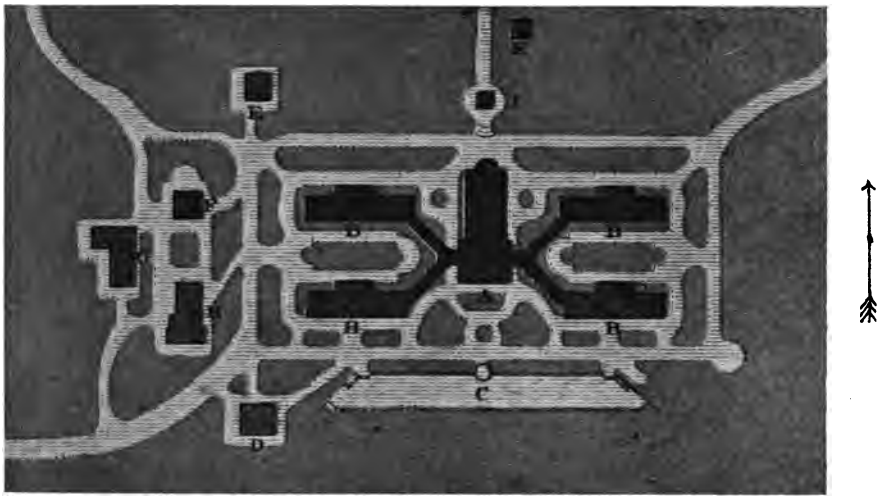
Just as the Riksdag had come to the rescue at a preceding juncture when difficulties presented themselves as to how a third sanatorium was to be built, so now that body generously voted in the year 1904 a sum of 200,000 Kronor to be added to the Jubilee Fund every year until it should be sufficiently large to provide security for the future subsistence of the sanatoria.

ÖSTERÅSEN SANATORIUM.

In devising the plans for this institution the promotors conceived the idea that timber might be suitably employed as a building material rather than stone. As the sanatorium was to be situated in the timber-producing part of Sweden par préférence, it was thought that this would contribute towards making the construction cheaper, especially as the Riksdag promised a much larger grant — in the form of building material — if timber was employed.

Although it turned out later that the saving in expense by the use of timber had probably been overestimated, the Committee decided for several reasons on keeping to their original idea. In order to preclude danger from fire and from hygienic considerations too, it was determined that the various wards should be erected as separate one-storey houses, grouped, with comparatively speaking

large intervals of space between each pair, around a central building, which was to contain the administrative offices, dining-rooms, common-rooms, etc. Thus, the ground plan of this sanatorium was entirely different from the one adopted for Hålahult, but the King had notified in his above-mentioned letter the desirability of the sanatoria being built in such a way as to serve as models for future institutions, of a similar kind, and seeing that it was impossible to know beforehand which of the proposed plans would prove to be



Plan of Österåsen Sanatorium.

the best, there seemed to be every reason to adhere to the original proposal for the Österåsen Sanatorium.

The above plan shows the relative positions of the different buildings. As may be seen from the cut (Page. 11), the sanatorium proper is built in the style of architecture in vogue for swedish castles in the 17th century. It is painted a pleasing yellow colour with mouldings in white and window and door frames in delicate green. Besides the main building running from N. to S. there are four pavilions which are united to the central edifice by corridors constructed of brick, running at an acute angle, the ground plan of the whole having roughly the form of an X. The basement storey of the central building is of brick, the rest of wood. The whole façade of the building measures 140·5 metres in length, though not of course

in one straight line, the central part lying 14 metres further back than the pavilions. The distance between those north and south pavilions which are on the same level as each other is 28 metres.

Entrance doors are situated both between the two corridors on each side of the main building and also at the points where the passages join the main building both to the north and south on each side. The principal approach is between the two west wings.

Österåsen Sanatorium. — Sitting-room

The main building has three storeys. In the basement there are offices, laboratory, baths, disinfecting-rooms, etc.

In the first storey, on either side of a large hall, there are the common-rooms to the south and the two dining-rooms to the north. A butler's pantry connects these dining-rooms with the spacious kitchen, which contains a large iron range, four steam boilers, and a heating-table. Adjoining the kitchen there are a larder, a scullery and a servants' dining-room. Adjoining the small dining-room there is a library. All along the south façade there runs a balcony 12

View from Österåsen Sanatorium.

Österåsen Sanatorium.

metres in length. The day-rooms admit of being thrown into one large assembly-room, as they are connected by sliding-doors. Of the two dining-rooms the larger one, which lies to the west, is capable of comfortably seating 100 persons; the smaller one lies to the east.

In the attic storey there are store-rooms and several living-rooms.

The four pavilions are devoted exclusively to the patients and their nurses and attendants, the western ones being for men, the eastern for women. As mentioned above, the pavilions are connected with the main building by corridors, which are 21 metres long and 2·80 metres broad. In case of danger from fire the pavilions can be shut off from the corridors. Each pavilion has accommodation for 28 patients.

The bedrooms all face the south. On the basement floor there are rooms containing 1, 2, 4 and 6 beds; in the centre the semi-private rooms, next to them the private ones, and at the ends the general wards for 4 or 6 persons. Altogether 80 persons can be accommodated in the general wards, 24 in semi-private rooms and 8 in rooms to themselves. To the north of the corridor there are the nurses' apartments, gas-stove kitchen, airing-cupboard and lavatory for the patients in the general wards. On the upper floor there are a few living-rooms.

Dimensions: —

General Ward for 6 patients	7·5 × 6·5 × 4·15	metres,
» » » 4 »	5·8 × 6·5 × 4·15	»
Semi-private Room	3·9 × 6·5 × 4·15	»
Private »	2·9 × 4·8 × 4·15	» .

All the rooms have rounded corners and colour-washed walls. One or more of the windows in each room and in the corridors are furnished with a patent fastening, named Perfect No. 1, which is always open, and on the opposite walls there are two ventilators, an upper and a lower one (ceiling and floor ventilators).

All the floors are covered with linoleum. The reclining-shelter, 100 metres in length, which is situated 37·5 metres south of the sanatorium, was constructed in such a way that it was dug out of the sloping hill-side, its back wall being the solid granite rock. The shelter is divided into two sections, one for men, the other for

women. Each of the two sections is subdivided by partition walls of wood and glass into three compartments.

In the shelter there are couches of iron with movable backs. Each couch has a thick mattress of vegetable and real horsehair and three rugs. In winter there is added a big bed-bag of sheepskin covered outside with homespun cloth, with a wolf-skin muff and a reindeer pelt.

Between the two main sections of the shelter and at each end of it there are rooms that can be warmed during the winter for keeping the rugs and the bed-bags in.

At 40 metres' distance from the West Pavilion the engine-house is situated. It includes washhouse, bakehouse, and disinfectingfurnace.

The electric lighting installation embraces 600 incandescent lights; the heating is by low pressure steam.

The sanatorium has a plentiful supply of excellent water.

Walks have already been laid out on the plateau above to a total length of about 4 kilometres and they afford every desirable variety in ascent and descent.

HÅLAHULT SANATORIUM

is situated, as already stated, in the Crown Domain of the same name about 20 kilometres north of the town of Örebro. The plans followed in the erection of Hålahult have been so exactly adopted for Hessleby and the internal arrangements at the two institutions are so nearly identical that a description of one only will here suffice.

HESSLEBY SANATORIUM.

The ground plan is a rectangle running north and south with two long wings projecting from the southern end at an obtuse angle. In the main the central building contains the administrative offices and the wings house the patients; the central part at the south end contains offices in the basement and, common-rooms on the first floor, while on the 2nd or top floor there are apartments for the assistant medical officer and the head nurse, an invalid's room for the officers of the establishment, and a room for the inspector. From the

Hälahult Sanatorium.

north the sanatorium appears as a two-storied building, from the south a three-storied.

The dimensions of the buildings turn out to be very considerable on a close examination. The distance from end to end is 118 metres, the length of the central part 44 metres.

The wings contain in the basement storey various storerooms and workshops, and in the two other storeys wards for patients.

In front of each wing, extending its whole length, there is a spacious reclining-shelter, 50 metres long and 3·2 metres broad, protected on either side by glass and with floors of limestone slabs.

On the north side of each wing there runs a corridor 2·5 metres in breadth, well lighted by twelve side windows and one at the end one; doors lead out of this into the patients' rooms, which all face to the south. Counting from the centre of the sanatorium there are first two private wards, then two general ones, two semi-private, two general ones again, and at the end two more semi-private ones. At the extremity of the wing there is a stone staircase connecting the two storeys with each other and with the courtyard below.

On the north side of the wing there is a small additional piece built out, containing four rooms, one of them for the nurse, besides subsidiary kitchen, lavatory, and W. C.

The floor space in the general wards (for 4 patients) is 5 by 6 metres, and in the private and semi-private wards 5 by 3 metres, the height being 3·5 metres.

The floors, consisting of iron beams withconcrete vaulting between, are all covered with linoleum. All the corners are rounded off and the walls are colour-washed. The window ledges are all of white marble. The windows are kept open at all states of the weather and have scarcely ever been closed during the seven years the sanatorium has been open. Ventilation is obtained through them very agreeably without any appreciable draught. On the walls opposite there are upper and lower ventilators (for summer and winter).

In fitting up and furnishing the wards cleanliness and simplicity have been principally considered. The bedsteads are of iron and have two mattresses each, a lower one of vegetable horsehair and

an upper one of real horsehair. The outside cover of the mattresses is made so as to be removed to allow of washing. The rest of the furniture, besides pillows and blankets, consists of a wardrobe, a writing-table and some chairs. A pocket is placed at the head of each bed for the patient's handkerchief, which it is not permissible for him to keep under the pillow.

Patients in private and semi-private wards have in addition to the above furniture a chest of drawers and a washstand each. The patients in the ordinary wards make use of the lavatory described above. In it there are wash-hand basins with hot and cold water-taps. Above the basins there is a shelf fixed to the wall, 2·5 metres in length, of ground glass. By means of lines and numbers painted on the wall behind, this shelf is divided up into a number of compartments, one for each of the patients who have to use the particular basin. On the wall opposite there are hooks for towels, likewise with numbers attached. For rinsing the mouth etc., there is a specially devised stand or sink, consisting of a large slab with two large holes in it beneath each of which stands a bucket. Round the slab there is a tallish upright edge to prevent splashing over. As the slab is $1\,^1/_2$ metres in breadth, two people can easily use it for cleaning their teeth at the same time, without splashing each other.

In the lavatory there is also a large enamelled cistern, to serve as a receptacle for patients' soiled handkerchiefs day by day. No one is allowed to have a handkerchief in use for more than one day. Every patient is required to take a clean handkerchief every evening.

From the reclining-shelter you enter the central body of the sanatorium by way of a long corridor, which serves the additional duty of a cloak-room and store-room for blankets. To the south of this corridor are to be found the various administrative offices etc., e. g. waiting-rooms, manager's office, Röntgen-ray department, testing-room, and laboratory.

The baths department is commodious and has two divisions, one for men and the other for women. It includes a disinfecting-apparatus for surgical appliances.

To the north of the baths department there are some cellars belonging to the kitchens.

On the first floor there are two well-lighted common-rooms looking south. Outside these rooms there is a balcony about 21 metres in length, extending along the whole of the central part of the building. On the north side there is a vestibule at the west end and a small dining-room at the east. All the available wall-space in the vestibule is occupied by bookcases containing the library belonging to the sanatorium (about 3,000 volumes). North of the two rooms just mentioned there is the large dining-room (17×8×5 metres). It extends throughout the breadth of the central building and can seat 130 persons comfortably.

On the upper floor in the central building are to be found, as already stated, apartments for the assistant medical officer, the head nurse, and also for some of the large staff of servants.

The heating is effected throughout by low pressure steam and radiators. The lighting is done by electricity.

To the west and east of the sanatorium there are situated two one-storied summer pavilions, large enough for 10 patients and one nurse each.

The sanatorium has water laid on throughout from a well at two kilometres' distance, which yields a very plentiful supply. The water proceeds by natural pressure to a spot from which it is pumped up to a reservoir on the hill 30 metres above the sanatorium. The cubic capacity of the reservoir is 180,000 litres; the daily consumption averages 45,000 litres. The waste water etc. passes into the Bruså River by a conduit 900 metres in length.

There are numbers of beautiful walks near the sanatorium, well sheltered from the wind and with plenty of variety as regards undulation. The total length of the walks already laid out is 10 kilometres.

On arrival at the sanatorium the invalid is usually given a tepid bath, unless his state of health forbids; he then goes to bed, where he remains for some days. In course of time, the length of which is dependent on his temperature and general condition, he is allowed to get up and commence the cure proper and by degrees, as soon as his physical powers allow of it, he will be able to be up all day

Hessleby Sanatorium. — Dining Room.

Park belonging to Hessleby Sanatorium.

long. The amount of bodily exercise he is to take, in the form of walking only, will be increased from time to time if thought suitable.

As soon as possible after his arrival he will be very thoroughly examined by the doctor.

The patient, naked from the waist upwards, will seat himself on a fairly high stool, placed so that the light falls on him from all sides and he can be examined consequently without any difficulty.

The method of percussion practised here is the very gentle finger-tapping method, for experience with that at the Hessleby Sanatorium has yielded the best results.

For determining the degrees of dulness it has proved to be insufficient to have only one degree between "Full tone" and "Absolute dulness". Consequently, Dr. Waller of the Hålahult Sanatorium instituted the 5 degrees system in 1903, the degrees being D^1, D^2, D^3, D^4, & D^5, to which he assigned suitable criteria. Experience shows that the Waller method is both easy to acquire after a few months' practice and also very practical, since if this method is employed one can notice even quite small alterations in the degree of dulness which may occur from one time to another. For further information on this subject the reader is referred to Dr. Waller's Essay in this volume: "Is Percussion as a Method of testing the lungs deserving of greater attention?"*

For the last four years the Waller method has been in use at all the Jubilee Fund Sanatoria and it is being introduced more generally elsewhere through the instrumentality of the numerous doctors who come to the sanatoria for a period of study.

During the auscultation, the method of which as a rule is short coughs at the close of the expiration, the patient is required to hold a double compress with cotton-wool between the two layers in front of his mouth to prevent a possible spreading of bubbles of air containing infectious matter.

Even though the danger of incurring the tuberculosis taint by inhalation may not be so great for grown-up people as was at one time thought, the precaution as regards pocket-handkerchiefs above

* Page 129.

referred to is nevertheless observed for the sake of the nurses and other attendants.

The expectoration-flasks that have been in use during the day are to be thoroughly cleansed every evening. The flask should be thoroughly rinsed out over an autoclave; the contents should be disinfected before being sent down the drain.

Great importance is attached to the so-called "Coughing regulations;" the attempt is made to give the patient as clear an idea as possible of the disease and the desirability and necessity of an observance of the measures of precaution which are prescribed at the sanatorium.

The Swedish National Anti-Tuberculosis Association has distributed six annual scholarships every year since 1904. Each of these scholarships entitles its holder to a two months' residence free of charge at one or other of the Jubilee Fund Sanatoria, but imposes the obligation upon him of doing such work as may be assigned to him by the medical superintendent, and especially of taking part in the examination of the patients. In the two months a scholarship-holder generally manages to be present at about 200 such examinations. Besides those students there are nowadays numerous other doctors who come to the sanatoria to spend some time there at their own charges for the purpose of studying the diagnostics and therapeutics of tuberculosis.

It is to be hoped that the clinical instruction thus inaugurated at the sanatorium may in the future, when a larger percentage of the doctors of the country shall have availed themselves of it, result in patients more regularly than is the case now coming to the sanatorium at a stage when they will derive more benefit from the cure.

PROGRAMME FOR THE DAY AT HESSLEBY (WEEK-DAY).

7. o'clock a. m.	Getting up.
7.30.	Porridge and milk.
8—8.15.	Morning service (voluntary).
7.30—8.15.	Douche.

9.30.	Superintendent's Round to all the patients in bed.
9—10.	Lying-down cure.
10.	Breakfast: Coffee and milk, butter, bread, cheese, anchovies and a hot dish.
10.30—12.	Walks.
11—12.	Polyclinic for diseases of the throat, nose and ear.
12—2 p. m.	Lying-down cure.
2.	Dinner: Two courses, soup and meat.
2.30—3.	Walks.
3—4.15.	Lying-down cure.
4.50.	Coffee.
5—6.	Walks.
6—7.	Lying-down cure.
7.	Evening meal.
7.30—8.	Walks.
8—9.	Lying-down cure.
9.	Glass of hot milk before going to bed.
9.30.	Assistant's Round. All lamps extinguished at 9.30.

The same programme, subject to some slight alteration, is observed on Sundays and Holy Days.

All the patients are weighed twice a month and medically examined every 5 or 6 weeks. The patients look forward to these events with a good deal of interest.

The Hålahult and Hessleby Sanatoria have room for 104 patients each in the sanatorium proper and for 10 more in each of the summer pavilions.

The patients are divided according to room and payment into the following classes: —

The Large Sanatorium.

Private room	Kr.	3.50	per	day	.....	8	patients
Semi-private room	»	2.50	»	»	.....	24	»
General ward	»	1.25	»	»	.....	42	»
» »	»	0.50	»	»	.....	30	»

The Summer Pavilions.

Semi-private room	Kr. 2.50 per day	4 patients
General ward	» 1.25 » »	10 »
» »	» 0.50 » »	6 »

The Österåsen Sanatorium has room for 28 patients in each of the 4 pavilions, making a total of 112, apportioned in the same ratio as at Hessleby and Hålahult among the four different grades.

The 360 places provided in the sanatoria were at once filled when the buildings were opened and double the number had to be refused admission. This unfortunate state of things still prevails, in spite of the constant succession of patients, owing partly to the insufficient accommodation at the sanatoria and partly to the great confidence people already place in the results of a stay at one of the sanatoria. The number on the books seeking admission is regularly 600 or 700, though in recent years about 900 patients have passed through the institutions each year.

The period of waiting is thus very protracted, varying from 2 months for those who pay the highest fee to 11 or 12 for those who pay the lowest. This has of course a very injurious effect upon the state of health of the applicants; by the time their turns arrive, some have already succumbed and others are so much worse that little or no improvement can be hoped for.

The three sanatoria are situated one in each of the three main divisions of the country; an applicant is not however restricted to the one in his respective province; it is indeed quite a common thing for patients to take a second course of treatment and then to resort to a different sanatorium.

The sanatoria are open to men and women equally. Of the applicants about 55 % to 60 % have been men and 40 % to 45 % women.

It was thought by some persons not well acquainted with the matter, that it would be inadvisable to have men and women in the same institution. The experience of the past six years proves such ideas to be quite beside the mark. Indeed, it is undoubtedly a distinct advantage for the sanatorium for the two sexes to be

present there, since both men and women display greater care in regard to their outward appearance, their dress and behaviour, and as to cleanliness and neatness than if they we reseparated one from the other.

The Swedish sanatoria are public institutions, but as they embrace patients paying different fees, different walks of life and degrees of culture are to be found represented here. The so-called working classes are in the majority, but there are very often one or more students, teachers, clergymen, or officers.

Good education or exalted position in society does not, as we know, always imply easy circumstances, and the mingling in the sanatorium of all sorts and conditions of persons is of beneficial influence upon the tone of intercourse there.

During the seven years the Sanatoria have been open the number of patients admitted annually at each has been:

	1900	1901	1902	1903	1904	1905	1906
Hålahult.....	168	312	266	282	324	316	305
Österåsen	—	141	296	311	279	291	293
Hessleby.....	—	91	277	333	347	326	331
	168	544	839	926	950	933	929

. During the same period the following number of patients have been discharged:

	1900	1901	1902	1903	1904	1905	1906
Hålahult..... ..	74	320	258	282	315	308	297
Österåsen	—	32	314	294	275	291	294
Hessleby.....	—	4	261	330	347	317	324
	74	356	833	906	937	916	915

The average age of the patients varies very little, being pretty constant between 25 and 30.

In grouping the patients according to the stages of the disease in which they are, the method followed is that with 3 stages,wich was

proposed by K. TURBAN of Davos in his "Beiträge zur Kenntnis der Lungentuberkulose" (Wiesbaden, 1889).

The cases in the first stage are classified as b or a, according to whether they are attended by fever or not.

In grouping the cases in accordance with the results of the treatment in the sanatorium a special method has been adopted. As it is so very difficult to judge whether a patient with consumption is fully restored to health or has only arrived at a pause when no catarrhal symptoms are present, the term "Cured" has been avoided and instead there has been used for the best result: "Materially improved", in the following account called A. In that category, consequently, there are included such cases as display at the final examination no subjective symptoms of the disease nor objective ones either (with the exception, however, of such inconsiderable and exceedingly frequent symptoms as breathing sound not quite clear, slight dulness, etc.; cf. Turban's proposals in the above-named work). The other cases of improvement are divided into two groups A.B. and B.

Group A.B. includes such cases as show material improvement but in which at the final examination there were found to remain comparatively speaking unimportant symptoms, e. g. a slight subjective symptom with no objective ones or vice versâ.

Group B. embraces all the other cases of improvement.

The remaining cases, representing that part of the work done at the sanatorium which has proved fruitless, are also subdivided into three groups: C., D. and E.

Group C. contains such cases as show neither improvement nor deterioration. These are not numerous, consisting principally of such persons as have only spent a very short time, a few days or weeks, at the sanatorium, too short a time indeed for any improvement to be noticeable.

Group D. contains those whose condition has become worse during their stay, and group E. those who have died at the sanatorium.

During 1900 74 patients were discharged from Hålahult. The following table shows the stage of the disease in which they were on entry and the result of the treatment: —

DISCHARGED IN 1900 FROM HÅLAHULT.

Stage at Entry (Turban)	Result at Discharge					
	A.	A.B.	B.	C.	D.	E.
6 male patients in stage I a	—	4	1	—	1	—
1 » » » » I b	—	—	—	—	1	—
13 » » » » II	—	—	12	1	—	—
21 » » » » III	—	—	15	3	2	1
6 female » » » I a	3	2	1	—	—	—
2 » » » » I b	—	—	1	—	1	—
7 » » » » II	—	1	5	—	1	—
17 » » » » III	—	—	10	—	6	1

One patient was found not to have tuberculosis and is consequently not included in the above table.

During 1901 320 patients were discharged at Hålahult.

DISCHARGED IN 1901 FROM HÅLAHULT.

Stage at Entry (Turban)	Result at Discharge					
	A.	A.B.	B.	C.	D.	E.
26 male patients in stage I a	1	8	13	1	3	—
2 » » » » I b	—	—	1	1	—	—
41 » » » » II	—	4	28	4	4	1
94 » » » » III	—	—	54	14	22	4
29 female » » » I a	3	13	9	1	3	—
17 » » » » I b	—	3	7	1	6	—
31 » » » » II	—	2	23	1	4	1
80 » » » » III	—	—	40	14	22	4

At Österåsen 32 patients were discharged in 1901.

DISCHARGED IN 1901 FROM ÖSTERÅSEN.

Stage at Entry (Turban)	Result at Discharge					
	A.	A.B.	B.	C.	D.	E.
9 male patients in stage I a	6	2	1	—	—	—
1 » » » » I b	1	—	—	—	—	—
1 » » » » II	—	—	1	—	—	—
7 » » » » III	—	—	—	5	2	—
1 female » » » I a	—	—	—	—	—	1
3 » » » » I b	—	—	1	1	1	—
2 » » » » II	—	—	—	2	—	—
8 » » » » III	—	—	2	2	4	—

In 1902 258 patients were discharged at Hålahult

DISCHARGED IN 1902 FROM HÅLAHULT.

Stage at Entry (Turban)	Result at Discharge					
	A.	A.B.	B.	C.	D.	E.
35 males in stage I a	2	25	7	1	—	—
3 » » » I b	—	—	2	1	—	—
40 » » » II	—	1	36	3	—	—
68 » » » III	—	—	48	8	11	1
19 females » » I a	1	11	6	1	—	—
13 » » » I b	—	2	8	3	—	—
35 » » » II	—	1	28	3	1	2
45 » » » III	—	—	25	10	7	3

The number of cases with results A. or A.B., corresponding together to what are termed at a number of sanatoria abroad "Relatively speaking cured", amount to 43, i. e. 16·6 %. The number with positive results is 203, i. e. 78·6 %.

At Österåsen 314 patients were discharged in 1902.

DISCHARGED IN 1902 FROM ÖSTERÅSEN.

Stage at Entry (Turban)	Result at Discharge					
	A.	A.B.	B.	C.	D.	E.
31 male patients in stage I a	15	3	12	1	—	—
9 » » » » I b	—	1	8	—	—	—
49 » » » » II	—	—	37	7	5	—
75 » » » » III	—	—	32	29	13	1
31 female » » » I a	12	4	12	3	—	—
22 » » » » I b	4	5	5	5	3	—
38 » » » » II	—	1	24	10	3	—
58 » » » » III	—	—	20	31	7	—

44 patients belonging to categories C and D. were sent to their homes as unsuitable objects for treatment at these sanatoria. Their times varied from 1 day to 63 days in the institutions. Excluding these 44, favourable results were obtained in 195 cases out of 269, i. e. 72·4 %.

At Hessleby 261 patients were discharged in 1902 (first year), with the following results:

A.	A.B.	B.	C.	D.	E.
2	35	145	65	2	12

Thus, positive results were obtained in 182 cases out of 261, i. e. 69·7 %.

In 1903 there were discharged: at Hålahult 282 patients, at Österåsen 294, at Hessleby 330, in the following stages at entry and conditions on discharge: —

Stage of Disease	Number of Patients			Result of Treatment																	
				A.			A.B.			B.			C.*			D.			E.		
	Males	Females	Total	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
Stage I a	127	135	262	3	3	6	33	55	88	59	58	117	30	18	48	1	1	2	1	—	1
» I b	12	36	48	1	3	4	—	8	8	9	16	25	—	7	7	1	2	3	1	—	1
» II	163	107	270	—	—	—	3	3	6	125	79	204	26	19	45	9	6	15	—	—	—
» III	158	141	299	—	—	—	1	1	2	112	82	194	29	35	64	12	18	30	4	5	9
Totals	460	419	879	4	6	10	37	67	104	305	235	540	85	79	164	23	27	50	6	5	11

Summary: —

Stage of Disease	Patients						Result of Treatment											
							Positive (A, AB, B)						Negative (C, D, E)					
	Males		Females		Total	Per-centage	Males		Females		Total	Per-centage	Males		Females		Total	Per-centage
	No.	%	No.	%			No.	%	No.	%			No.	%	No.	%		
Stage I (a and b)	139	30.2	171	40.8	310	30.7	105	75.5	143	83.6	248	80.0	34	24.5	28	16.4	62	20.0
» II	163	35.4	107	25.5	270	35.3	128	78.5	82	76.6	210	77.8	35	21.5	25	23.4	60	22.2
» III	158	34.4	141	33.7	299	34.0	113	71.5	83	58.9	196	65.5	45	28.5	58	41.1	103	34.5
Totals	460	100	419	100	879	100	346	75.2	308	73.5	654	74.5	114	24.8	111	26.5	225	25.5

* Including 12 cases at Österåsen which were regarded on entry as latent.

In 1904 there were discharged: at Hålahult 315 patients, at Österåsen 275, and at Hessleby 347, in the following stages at entry and conditions on discharge: —

Stage of Disease	Number of Patients			Result of Treatment																
				A.			A.B.			B.			C.			D.			E.		
	Males	Females	Total	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
Stage I a	144	147	291	6	9	15	53	63	116	75	61	136	10	12	22	—	2	2	—	—	—
» I b	29	49	78	—	3	3	14	22	36	12	21	33	2	1	3	—	2	2	1	—	1
» II	153	116	269	—	—	—	7	1	8	132	87	219	11	17	28	2	10	12	1	1	2
» III	157	116	273	—	—	—	—	1	1	109	69	178	36	32	68	7	13	20	5	1	6
Totals	483	428	911	6	12	18	74	87	161	328	238	566	59	62	121	9	27	36	7	2	9

Summary: —

Stage of Disease	Patients						Result of Treatment											
							Positive (A, AB, B)						Negative (C, D, E)					
	Males		Females		Total	Per-centage	Males		Females		Total	Per-centage	Males		Females		Total	Per-centage
	No.	%	No.	%			No.	%	No.	%			No.	%	No.	%		
Stage I (a and b)	173	35.8	196	45.8	369	41	160	92.5	179	91.8	339	91.9	13	7.5	17	8.7	30	8.1
» II	153	31.7	116	27.1	269	29	139	90.8	88	75.9	227	84.4	14	9.2	28	24.1	42	15.6
» III	157	32.5	116	27.1	273	30	109	69.4	70	60.3	179	65.6	48	30.6	46	39.7	94	34.4
Totals	483	100	428	100	911	100	408	84.5	337	78.7	745	81.8	75	15.5	91	21.3	166	18.2

In the above-given 911 cases there are not included: 1 patient at Hålahult, the diagnosis of whose condition gave uncertain results, and 25 patients at Österåsen, of whom 12 were considered not to be suffering from tuberculosis and 13 were uncertain.

In 1905 there were discharged: at Hålahult 308 patients, at Österåsen 291, and at Hessleby 317, in the following stage at entry and condition on discharge: —

Stage of Disease	Number of Patients			Result of Treatment																	
				A.			A.B.			B.			C.			D.			E.		
	Males	Females	Total	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
Stage I a	156	167	323	—	8	8	58	63	121	88	73	161	8	20	28	2	3	5	—	—	—
» I b	22	17	39	—	1	1	2	3	5	16	12	28	1	2	3	1	—	1	1	—	1
» II	156	112	268	—	—	—	2	2	4	130	87	217	21	16	37	3	5	8	—	2	2
» III	143	136	279	—	—	—	—	2	2	100	84	184	32	36	68	10	12	22	1	2	3
Totals	477	432	909	—	9	9	62	70	132	334	256	590	62	74	136	16	20	36	2	4	6

Summary: —

Stage of Disease	Patients						Result of Treatment											
							Positive (A, AB, B)						Negative (C, D, E)					
	Males		Females		Total	Per-centage	Males		Females		Total	Per-centage	Males		Females		Total	Per-centage
	No.	%	No.	%			No.	%	No.	%			No.	%	No.	%		
Stage I (a and b)	178	37.3	184	42.6	362	39.8	165	92.7	159	86.4	324	89.5	13	7.3	25	13.6	38	10.5
» II	156	32.7	112	25.9	268	29.5	132	84.6	89	79.5	221	82.5	24	15.4	23	20.5	47	17.5
» III	143	30.0	136	31.5	279	30.7	100	69.9	86	63.2	186	66.7	43	30.1	50	36.8	93	33.3
Totals	477	100	432	100	909	100	397	83.2	334	77.3	731	80.4	80	14.8	98	22.7	178	19.6

9 patients, whose diagnoses yielded uncertain results, are not included.

In 1906 there were discharged: at Hålahult 297 patients, at Österåsen 294, and at Hessleby 324, in the following stages at entry and conditions on discharge: —

Stage of Disease	Number of Patients			Result of Treatment																	
				A.			A.B.			B.			C.			D.			E.		
	Males	Females	Total	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
Stage I a	159	160	319	2	4	6	49	49	98	97	99	196	9	8	17	1	—	1	—	—	—
» I b	12	24	36	—	—	—	2	9	11	6	11	17	2	3	5	2	1	3	—	—	—
» II	139	106	245	—	—	—	2	1	3	113	85	198	19	14	33	5	5	10	—	1	1
» III	160	126	286	—	—	—	—	2	2	112	78	190	34	32	66	7	16	23	8	3	11
Totals	470	416	886	2	4	6	53	61	114	328	273	601	64	57	121	15	22	37	8	4	12

Summary: —

Stage of Disease	Patients						Result of Treatment											
							Positive (A, AB, B)						Negative (C, D, E)					
	Males		Females		Total	Per-centage	Males		Females		Total	Per-centage	Males		Females		Total	Per-centage
	No.	%	No.	%			No.	%	No.	%			No.	%	No.	%		
Stage I (a and b)	171	36.4	184	44.2	355	40.0	156	91.2	174	94.6	330	93.0	15	8.8	10	5.4	25	7.0
» II	139	29.6	106	25.2	245	27.7	115	82.7	86	81.0	201	82.0	24	17.3	20	19.0	44	18.0
» III	160	34.0	126	30.6	286	32.3	112	70.0	80	63.7	198	69.2	48	30.0	46	36.3	94	30.8
Totals	470	100	416	100	886	100	383	81.5	340	81.7	723	82.3	87	18.5	76	81.7	163	18.4

29 patients at Österåsen, whose diagnoses gave uncertain results, are not included.

As the above summaries for the past years amply show, the cases where patients at the time of their entry are at an advanced stage of the disease (Turban's Stage III) are still far too numerous. This unfavourable state of things is, however, likely soon to disappear or become much ameliorated owing to the increasing knowledge among doctors of the kind of cases suitable for sending to the sanatoria, which itself is a result of the courses of clinical instruction given to medical men at the institutions.

The following summary is given to show still more clearly how the various stages (on Turban's principle of subdivision) were represented at the sanatoria in 1900—1906.

	Stage I	Stage II	Stage III
1900	20 %	20 %	53 %
1901	25 »	21 »	54 »
1902	24 »	27 »	49 »
1903	31 »	35 »	34 »
1904	41 »	29 »	30 »
1905	40 »	30 »	30 »
1906	40 »	27 »	32 »

On the 1st of January 1907 there had been discharged from the Jubilee Fund Sanatoria as many as 4937 patients.

The average duration of the cure administered was as follows (in days): —

	1900	1901	1902	1903	1904	1905	1906
Hålahult	94·2	114	139	134	133	125	142
Österåsen	—	67·6	117	139	156	141	145
Hessleby	—	—	—	123	121	126·5	133·5

The average increase in weight for all patients (in kilogrammes): —

		1900	1901	1902	1903	1904	1905	1906
Hålahult	males	5.6	4.3	6.5	6.7	5.1	4.2	3.8
	females	3.6	3.6	3.9	4.6	3.1	2.1	3.1
	all	4.7	4	5.4	5.7	4.2	3 3	3.4
Österåsen	males	—	7.6	6.4	6	4.7	5.5	5.2
	females	—	2.3	4.7	4	3.9	3.5	3.4
	all	—	5.4	5.6	5.08	4.3	4.5	4.4
Hessleby	males	—	—	—	5.5	5.7	6.7	6.2
	females	—	—	—	4.5	4.8	4.6	3.3
	all	—	—	6.1	5	5.2	5.7	4.9

This table includes those who lost in weight and those whose weight remained stationary.

The maximum increase of weight was: —

	1903	1904	1905	1906
At Hålahult	20.7	16.1	17.2	15.8
» Österåsen	25.2	15	17.6	18.4
» Hessleby	20.4	18.1	25.1	25.6

Bacilli were found in the sputum in the following percentages of cases: —

	1900	1901	1902	1903	1904	1905	1906
At Hålahult	71.2 %	76.1 %	61.3 %	55.6 %	53.2 %	46.9 %	57.9 %
» Österåsen	—	69 »	49 »	55.4 »	53.2 »	55.3 »	52 »
» Hessleby	—	—	71 »	59 »	49.3 »	42.3 »	41 »

To exemplify the amounts of income and outgo in the space of one year, the following summary for 1906 is here appended: —

Fees for Nursing	Hålahult		Österåsen		Hessleby		Totals	
	Kr.	öre	Kr.	öre	Kr.	öre	Kr.	öre
For 8 beds in private rooms at Kr. 3.50	9,415	—	11,886	—	11,405	50	32,706	50
» 28 » » semi-private » » » 2.50	24,520	—	—	—	22,181	50	46,701	50
» 24 » » » » » » 2.50	—	—	21,292	50	—	—	21,292	50
» 52 » » general wards » » 1.25	21,500	—	—	—	21,116	75	42,666	75
» 47 » » » » » » 1.25	—	—	20,368	75	—	—	20,368	75
» 36 » » » » » » 0.50	5,431	50	—	—	5,644	—	11,075	50
» 33 » » » » » » 0.50	—	—	6,216	50	—	—	6,216	50

Expenditure per day and patient: —

	Hålahult	Österåsen	Hessleby
	öre	öre	öre
Diet	122.88	144.78	113.20
Salaries and Wages	54.91	61.21	53.48
Heating and Lighting	19.97	54.65	26.28
Upkeep and Renewal of Equipment	15.27	11.94	12.05
Upkeep of Buildings and Grounds	20.08	17.30	10.25
Washing and Cleaning	4.06	6.45	3.28
Medicines, Disinfectants, Nursing and Laboratory Equipment	12.32	6.63	6.71
Stables	2.67	1.42	2.04
Clerical and Printing Expenditure	1.14	1.36	0.66
Rates, Taxes, etc.	0.83	1.11	0.27
Sundry Expenses	5.47	6.12	6.55
	259	312.97	234.77

Total No. of Food Days:

	Hålahult	Österåsen	Hessleby
for Patients	42,001	40,565	42,379
for Staff	17,101	14,669	14,395
Hence, expenditure on food per day and person (in öre) was: —	87	106·33	84·58

The Jubilee Fund has received the following additions since it was started:

In 1901 from Prof. Geskel Salomon and wife	Kr.	30,000: —
In 1904 Jan. 21, 75th birthday af H. M. the King Collection amounting to.....	»	249,943: 32
In 1904 from Consul Robert Bünzow and wife ..... (The interest on which to be distributed by medical superintendent at Hålahult to needy patients).	»	10,000: —
In 1904 from a Medical Association	»	900: —
In 1904 further donation from Consul Bünzow	»	5,000: —
In 1906 from C. J. Flodquist ..... (Same proviso as above).	»	5,000: —
In 1906 from W. Schelin	Kr.	10,000: —
In 1906 from E. Ekeroth .... (Same stipulation as above but for the Hessleby Sanatorium).	»	10,000: —

The Governing Bodies of the sanatoria have also received small sums of money for various specified purposes.

The following are some of the publications dealing with tuberculosis that have been issued by the medical officers at the Jubilee Fund Sanatoria: —

1. The Annual Reports of the work carried on at the sanatoria and a particular account of each institution.
2. "A Study on Percussion for the Lungs", by Dr. C. E. Waller, Medical Superintendent at the Hålahult Sanatorium (1903 Annual Report of the Sanatoria).
3. "Is Percussion as a Method of testing the Lungs deserving of greater Attention?" by Dr. Waller (included in this Work)*.
4. "The Pulse-rhythmic Respiratory Sound", by Dr. Waller (included in this Work)**.
5. "What Cases of Consumption of the Lungs are suitable for Admission at the Public Sanatoria?" by Dr. J. Tillman, Medical Superintendent at the Österåsen Sanatorium.

* Page 129. ** Page 134.

6. »Contributions to the Pathological Anatomy of Tuberculous Pleuritis», by Dr. E. Wadstein, Medical Superintendent at the Hessleby Sanatorium (included in the annual publications of the Lund University for 1900).

King Oscar II's Jubilee Fund and the Sanatoria built out of it are administered by a Body of councillors and a Governing Board, which latter is located in Stockholm. Each of the sanatoria has a special Governing Body of its own besides.

The councillors must be more than 60 but less than 80 in number, selected so as to represent as far as possible the various parts of the country. They are nominated by His Majesty the King and meet once a year in Stockholm.

The Governing Board has 5 members with two substitutes. They administer the Jubilee Fund and the sanatoria, being responsible to the Body of Councillors for their decisions and actions.

The immediate management of each sanatorium is vested in a Governing Body consisting of a Chairman, the Medical Superintendent, 2 ordinary members and 2 substitutes.

CONTRIBUTIONS TO PHYSICAL METHODS OF DIAGNOSIS

BY

C. E. WALLER, M. D.,

MEDICAL SUPERINTENDENT AT THE HÅLAHULT SANATORIUM.

I. IS PERCUSSION AS A METHOD OF TESTING THE LUNGS DESERVING OF GREATER ATTENTION?*

THE AUTHOR first points out the essential difference in principle that exists in the way in which the two methods of examining the lungs, viz. percussion and auscultation, are usually employed. In auscultation it is the character of the respiratory sound that is directly observed, the inspiration, the expiration, râles, etc., whereas in percussion, by reason of the importance attached to the symmetrical-comparative method, the investigation does not, as a rule, proceed farther than to the examination of *the difference* in the percussion sound produced at two particular spots which are compared and consequently does not arrive at the really essential point of the percussion, viz. the establishing of the special character of the percussion sound itself.

Next the shortcomings of the symmetrical-comparative method are more particularly pointed out; these are summarised in the two following statements: —

* Owing to the limited space, this and the following essay on "The Pulse-rhythmic Respiratory Sound" are contributed in the form of short extracts by the author. For the essays in full, readers are referred to the pages of the Swedish Journal "Hygiea" for the current year, and to the "Nordiskt Medicinskt Arkiv", where they appear in German. The address of the publishers of each of these journals is: Stockholm, Sweden.

1. *If there be a dulness in the percussion sound heard at two symmetrical spots, and the difference in the degree of dulness is indistinct, as is not infrequently the case, the dulness may remain unnoticed at both spots.*

2. *If there be a dulness in the percussion sound heard at two symmetrical spots, and the difference in the degree of dulness is distinct, which often occurs, the dulness at the spot where the degree of dulness is greater may be miscalculated, i. e. underestimated, and the dulness at the other spot be neglected altogether.*

If it is remembered, furthermore, that dulness in cases of tuberculosis of the lungs usually occurs *on both sides of the lungs*,* it will be clear that there must exist another shortcoming of this method as a corollary of those above-mentioned, and one which has been still less observed than they. That is, that *the degree of dulness in general*, even and indeed more especially when it is considerable, is regularly underestimated, and this to such an extent, that it is actually *a very rare thing* to find *a high degree of dulness registered* in for instance medical reports.**

The author gives examples of this by showing how seldom one comes across any notice of a high degree of dulness, even, for instance, in TURBAN's casuistry of cases in the third stage of the disease in his famous work, "Beiträge zur Kenntniss der Lungentuberkulose".

It is emphatically pointed out that it is absolutely necessary in employing the percussion method, to determine the special character of the percussion sound. Among the percussion sounds to be heard from the lungs the author distinguishes three principal kinds: 1) the so-called *non-tympanitic*, 2) *the relâchement-tympanitic*, and 3) what he at the suggestion of *Levi Bergström* calls *the tracheal-tympanitic sound.*

The author discusses the character of the non-tympanitic sound in different stages of the development of tuberculosis of the lungs from the incipient stage right on to the cavity, showing thereby that these characteristics give a basis for the determination of the pre-

* C. E. WALLER, En studie i perkussion af lungorna. Hygiea 1904 p. 125.

** Loc. cit.

sence and degree of dulness quite independently of the symmetrical-comparative method.

Then the author describes his own new percussion method, already published in "Hygiea" in 1904, adding here such modifications and developments in the method as have since then been made.

This is how it runs in summarized form: —

I. *Weak Percussion.*

a) The non-tympanitic sound is heard throughout the respiration, but somewhat, or distinctly, short: — *1st. Degree of Dulness* (sign: D^1).

b) The non-tympanitic sound is heard only during a portion of the respiration, when the breathing is ordinary or forced: — *2nd. Degree of Dulness* (sign: D^2).

c) The non-tympanitic sound is not heard.

The degree of percussion is increased to: —

II. *Medium Percussion.*

a) The non-tympanitic sound is heard: — *3rd. Degree of Dulness* (sign: D^3).

b) The non-tympanitic » » not » .

The degree of percussion is increased to:

III. *Strong Percussion.* *

a) The non-tympanitic sound is heard: — *4th. Degree of Dulness* (sign: D^4).

b) The non-tympanitic » » not » : — *5th. Degree of Dulness* (sign: D^5).

By this new method, for some years employed by a number of Swedish doctors, it is possible to determine the different degrees of dulness with greater accuracy, so that for instance, a difference in the degree of dulness from one examination to another can be more readily determined, and the different degrees of dulness, particulary the higher ones be more correctly estimated; the method

* Of course it is not here a question of a medium or strong tap in the ordinary sense, but only of a less "slight" or "still less slight" tap.

also enables the examiner to detect without any great difficulty an incipient dulness at an earlier stage than what is now generally the case. Besides that, it is noticed that, when this method is employed, different examiners are relatively speaking much more in agreement in their determinations of the degree of dulness present than they were before. The results can, furthermore, be arrived at without recourse being had to the symmetrical-comparative method at all. The latter method ought consequently be relegated to a the subordinate place, analogous to one occupied by the similar method applied in conjunction with auscultation.

In view of the known difficulties offered by percussion at the fossæ supraclavicularis and supraspinata, as pointed out by *Isak Jundell* in a monograph* deserving attention and by others, the following practical advice may be given to anyone intending to adopt the new percussion method: — Begin the percussion of the back and the front, not at the fossæ above mentioned but at the places which under normal conditions yield a clear and full percussion sound, viz. in front at the *fossa infraclavicularis* somewhat external to its centre, and on the back in the neighbourhood of the angulus scapulae in the *spatium infrascapulare* or in the *trigonum stetoscopicum*.

Percussing *the back* offers special points of interest. If on beginning for instance at the trigonum stetoscopicum on theleft side, you find the nontympanitic sound, and then proceed making the percussion from below upwards, being careful to notice when this sound is no longer heard at a slight tap (is superseded, for instance, by the relâchement-tympanitic sound), you will as a rule find, on applying the same method of percussion on the other, the right side, that *the border of the audible non-tympanitic sound reaches further down on that side, where a higher degree of dulness is heard in front at the fossa infraclavicularis.*

The author explains next why the number of five degrees of dulness has been considered suitable. By subdividing the dulness of light percussion into two degrees greater attention is paid to

* Bemerkungen zur Percussion der Lungenspitzen. Zentralblatt für innere Medizin 1904, No. 17.

these slighter degrees of dulness, which consequently will not so readily escape observation. The medium degree of dulness, D^3, which is of frequent occurrence both in milder and in more severe cases of lung affection, should of course exist as a separate category. Finally, the two degrees of dulness with strong percussion, (D^4 and D^5), cannot but be differentiated, and that on account of a special reason. It is namely in the fifth degree of dulness (D^5), that the strange phenomena of sound variation, noticed long ago by WINTRICH and others, are almost exclusively to be found. Whenever D^5 occurs, those phenomena must be expected. The fifth degree of dulness consequently constitutes in itself a reply to the hitherto unanswered question: — *When is one to look for the sound-variation phenomena?* Moreover, with this guidance one meets with the phenomena much oftener than formerly, when it was, so to say, only by accident that one came across them. The author gives examples of that by citing similar cases from his own and TURBAN'S casuistries. To help us to detect WINTRICH'S phenomenon more readily, the author recommends the employment of *a new technical detail in percussion.* The indirect percussion, as we know, should as a rule be made with a slight tap on the plessimeter pressed firmly against the chestwall. There is one exception to this rule viz. when percussing for the *tracheal tympanitic* sound. For that sound comes out more plainly, purer and less obscured by or mixed with other sounds, if the examiner does not press the plessimeter finger (the author prescribes the almost exclusive use of fingerfinger percussion) firmly on the underlying, structures but holding it straight and firm by its extensor and flexor tendons allows the ball of the finger to pass lightly over the skin while percussing "staccato" with the hammer-finger (the top or the ball of the finger) on the back of the last phalanx of the plessimeter finger. The direct percussion of the tracheal tympanitic sound, for instance, on the clavicle is produced by a tap, not with the top of the finger as usual but with the ball of the finger.

The essay concludes with the following summing up of its contents: —

1. *By noticing the varying character of the non-tympanitic sound, by different strength of percussion, dulness can be detected and its*

degree established with more certainty than otherwise and quite independently of the symmetrical-comparative percussion method.

2. *The symmetrical-comparative percussion method as usually applied is insufficient and delusory for the determination of the presence and degree of dulness; it should therefore not occupy the prominent position it now does.*

II. THE PULSE-RHYTHMIC RESPIRATORY SOUND.

After a statement of the views at present held by EICHHORST, SAHLI, TURBAN, BRECKE, HENSSEN, AUFRECHT and others, regarding the systolic vesicular breathing and the saccadated respiratory sound, the author gives the result of his own observations and points out that *both the saccadated and the systolic respiratory sounds are characterized by the inspiratory and sometimes also expiratory sounds of respiration not being uniform throughout but increasing undulatory, and that these increases, the saccades, always occur simultaneously with the rhythmic beats of the pulse.*

After having come to that conclusion himself, the author had HENSSEN's Essay* brought to his notice, in which that writer asserts that the saccadated breathing is as a rule pulse-rhythmic. It may seem strange that this observation, which appears so simple, was not made earlier, or at any rate that more attention was not paid to it after HENSSEN's essay appeared. This strange fact may be explained, however, by the circumstance that, not only for the discovery itself but also for the controlling of its correctness a simultaneous observation of two phenomena is obligatory, viz. the saccadation and the pulse-wave (or the cardiac systole), and besides that, a conception of their synchronism, — consequently a comparatively complicated exercise of the mental faculties.

The two phenomena should for the future be grouped together under one heading. The one suggested by HENSSEN appears suitable to the author: — *The Pulse-Rhythmic Respiratory Sound.*

When saccadation is observed to be present both at the inspiration and the expiration, the rhythm is heard to be the same that is

* Deutsches Archiv für klin. Medizin, 1902, Bd 74, S. 230.

to say the saccades are pulse-rhythmic both in the inspiration and the expiration. This shows *how untenable is the assumption that the phenomena are dependent on the negative systolic pressure in the thoracic cavity resultant from systole* (POTAIN and others). That pressure might possibly explain the rhythmic increase of the respiratory sound during inspiration, but not during exspiration, where one would expect to find a rhythmic decrease of the sound, which is not the case.

As regards the localisation of the pulse-rhythmic respiratory sound the author states that it occurs *in the vicinity of the large blood-vessels and the heart;* he mentions specially the fact that it is to be heard also on the back near the *aorta thoracica.* As the spots most favourable for its detection, (termed together *a pulse-rhythmic centre*), the author mentions the *2nd right inter-costal space* (on the auscultation spot for the aorta), the *2nd left inter-costal space* (on the auscultation spot for the aorta pulmonalis), in the *1st inter-costal spaces on either side* (also in the neighbourhood of the sternum) and *in the region of the heart.* On the back it may be heard in the vicinity of aorta thoracica, i. e. in the *spatium interscapulare on the left side from the hight of the processus spinosus of the 5th thoracic vertebra downwards past the scapula to the base of the lung.* In cases of "situs inversus viscerum" the localisation of the systolic respiratory sound is reversed, which the author had the opportunity of observing in one case.

The pulse-rhythmic respiratory sound arises in the following way: — the tissue of the lungs in those parts of the lungs that are situated near the large blood-vessels and the heart, are subject to a mechanical pressure by every pulse-wave in the vessels and by every heart-movement in systole. Thereby the delicate air-passages with their soft compressible walls, within which the vesicular sound is produced, become narrowed, and the velocity of the current of air increased at every pressure the rapidity of the current of air, thus increased in a pulse-rhythmic manner, occasions an intensifying of the respiratory sound, so that it is heard louder in proportion to the rhythm of the pulse.

The author states that he has occasionally heard *another saccadation* in addition to the ordinary systolic ones. It is always much fainter

than the systolic one but it is to be heard simultaneously with the diastole, a fact which has led the author to compare the saccadation to *an acoustic pulse-curve.*

Finally, it is pointed out that the saccadations very often disappear when the breathing is forced and that to discover the phenomenon the examiner must wait for a moment when the pulse-wave strikes the lung tissue during an audible part of the respiratory sound, preferably at inspiration.

The pulse-rhythmic respiratory sound is a phenomenon which occurs practically always in patients suffering from tuberculosis of the lungs. The systolic vesicular breathing has likewise been long known to occur very commonly both in healthy persons and invalids, and to it as a rule no pathological import is attached. As the result of the author's investigations goes to show that there is no distinction between a saccadated and a systolically intensified respiratory sound, and that both arise from the same cause, it may be assumed that *the pulse-rhythmic respiratory sound is not to be regarded as a pathological signe, at any rate for the lungs.* But supposing the pulse-rhythmic respiratory sound is to be heard plainly and extending far outside the pulse-rhythmic centre, and especially in the fossæ supraclavicularis and supraspinata and in the lower back part of the right lung, i. e. in spots which are, relatively speaking, rare for its occurrence, an observation should be made of *the organs of circulation*, more especially of *the heart* and its workings.

INSTITUTIONS FOR THE TREATMENT OF TUBERCULOSIS IN SWEDEN

MAIN POINTS

GATHERED BY

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UNTIL the last few years but little attention had been paid in Sweden by authorities, public and physicians to the great importance of Tuberculosis as an endemic disease. No sooner than during the last ten years emphasis has been laid on this question and measures on a larger scale have been adopted against this scourge of mankind.

The Swedish Medical Society, however, had as far back as 1884, thoroughly treated the scientific side of the tuberculosis question, and at the general Swedish Medical Congress at Norrköping, in 1887, a committee was commissioned to endeavour to gain an exact knowledge of the extension of tuberculosis in man and cattle by means of sending forms of inquiry to physicians and veterinary surgeons all over the kingdom. At the following medical congresses the interest in the tuberculosis question was still on the increase.

In 1896, the Swedish Medical Society treated the question from a more practical and social point of view, and having devoted several meetings to the discussion of this topic, passed the resolution that the following measures should be taken:

The erection of sanatoria for curable consumptives;

The establishment of asylums for advanced cases of consumption;

The destruction of the consumptives' sputa in, assembly rooms, railway carriages etc.;

The disinfection of dwelling-places that have been inhabited by consumptives;

The publishing of pamphlets on tuberculosis for the instruction of the public how to prevent and combat the disease;

To fight against tuberculosis in our domestic animals.

The Swedish Medical Society as well as the general medical congresses have since then always had the tuberculosis question on their programmes. In 1904 this question formed the principal object for discussion in the Swedish Medical Society and then, among other resolutions passed, it was decided that more attention than hitherto should be paid to the need of institutions for the treatment of consumptive patients and that the State should grant support for the erection and maintenance of such institutions.

The 18th of September 1897, 25th anniversary of King Oscars II accession to the throne, marks the day on which the fight against Tuberculosis in Sweden actually commenced. On that day His Gracious Majesty the King determined that the sum of 2,200,000 Kronor,* collected by his subjects and presented to him in order to celebrate this happy event, should be used for the erection of popular sanatoria for consumptive patients.

It is not the intention of this article to give a history of the foundation and development of the popular sanatoria nor to describe how the Swedish Parliament, sensible of the usefulness of those institutions, allotted further necessary funds for their erection and maintenance; nor have I to give an account of the activity displayed in the campaign against tuberculosis by the Swedish National Anti-tuberculosis Association formed in February 1904.

As to the particulars of the above matters I refer to the articles of doctors Buhre** and Wadstein*** included in this publication.

Stockholm. Of late years the mortality from tuberculosis has relatively decreased in Stockholm, a city which in 1907 reckoned a little more than 332,000 inhabitants. On that subject, Dr. Linroth, President of the Royal Board of Health, has for the years 1879—1903

* 1 krona = 0,265 $ ** Page 5. *** Page 92.

produced some very suggestive figures. Dividing those 32 years into 6 periods of 5 years each and 1 of 2 years (1901—1902), he shows that out of a group of 10,000 persons, there died from tuberculosis during these periods 38,8; 40,8; 35,9; 31,6; 27,2; 24,9; 23,9 resp., or if the death-rate for the first period is expressed by 100, the figures for the following periods will be: 105; 92; 81; 70; 64; 62 resp. Thus the mortality from tuberculosis shows a fall in Stockholm during these 32 years of 38 per cent, which on an average makes 1 per cent per year.

But in spite of this decrease the ravages of tuberculosis are still considerable. The total mortality in Stockholm during the period 1871—1905 was 114,716 persons, out of whom 16,183 died from tuberculosis; every seventh death was thus caused by consumption; if the deaths occurred at a tender or high age, at which ages other causes of death prevail, are deducted from that number, it will be found that every third person between 10 and 40 succumbed to tuberculosis.

The following figures show the state of mortality from tuberculosis in Stockholm in 1906:

Pulmonary tuberculosis	690 cases
Tuberculous meningitis	134 »

The total number of deaths occurring that year was 4,588.

In 1896 Dr. Linroth, presented to the Board of Health of Stockholm a report, in which he expressed the following desiderata with regard to the effective combat of tuberculosis in Stockholm:

1) The erection of a sanatorium with 100 beds to begin with;

2) The establishment of an asylum for tuberculosis patients at an advanced stage, in connection with one of the municipal hospitals; the asylum should contain 100 beds;

3) The disinfection at the public expense of dwellings which had been inhabited by consumptives;

4) The publishing and spread of advice to and directions for the public with regard to the nature and danger of tuberculosis.

The next year the Board of Health nominated a committee for the study of the necessary measures to be taken with regard to a rational organization of the treatment of tuberculosis in the capital. This committee proposed the erection of a sanatorium and an asylum for advanced cases and recommended, moreover, the establishment of an isolation pavilion with 32 beds at the Sabbatsberg Hospital. The Town-council determined upon the establishment of such a pavilion, which was actually opened in 1897.

250—330 beds were considered necessary for consumptive patients

The first hospital-building for consumptives at St. Göran's Hospital.

in an advanced stage of the disease, and the average duration of treatment for these patients was estimated at 150 days.

In 1902 the first hospital with 108 beds was opened at St. Göran's Hospital. The expenditure had been 196,500 Kronor, or about 2,000 Kronor per bed; the furniture etc. had cost 40,000 Kronor.

One more pavilion for consumptives with 124 beds (out of which 50 for children) has been erected at St. Göran's Hospital and has been in operation since the commencement of 1907.

In the public work-houses about 300 consumptives receive nursing.

Thus the city of Stockholm possesses the following number of beds for its tuberculous indigent inhabitants:

The Sabbatsberg Hospital	32	beds
St. Göran's Pavilion I	108	»
» » » II	124	»
Public work-houses	300	»
Total	564	beds

Moreover, there are places for a smaller number of consumptives in the other hospitals of the town.

Park of St. Göran's Hospital.

But even in other ways Stockholm takes care of its consumptive pauper inhabitants; thus the capital defrays the expenses for the maintenance of those indigent consumptives who are admitted into some of the Jubilee Fund Sanatoria. During 1905, 147 persons of Stockholm were treated in those sanatoria at an expenditure of about 30,000 Kronor. The Towncouncil allotted in 1897 a sum of 200,000 Kronor to a fund for that, and in 1904 the same amount.

Scrofulous children of indigent parents are nursed at sea-side

sanatoria, and, in summer, holiday colonies are sent into the mountains in Jemtland; at the cost of a private person, a home has been opened for consumptive working women; examination of the consumptives' sputa are effectuated free of charge at the laboratories of the Board of Health; disinfection of the consumptives' dwellings is done at the cost of the town etc.

A municipal *anti-tuberculous dispensary* has been founded; this institution which gets an annual subvention of 25,000 Kronor, has displayed an activity which has already proved to be of the greatest usefulness.

As to the *dwelling-house* which the National Association has opened for indigent working families infected with tuberculosis is referred to the article of Dr. Buhre: "The Swedish Anti-tuberculosis Association."

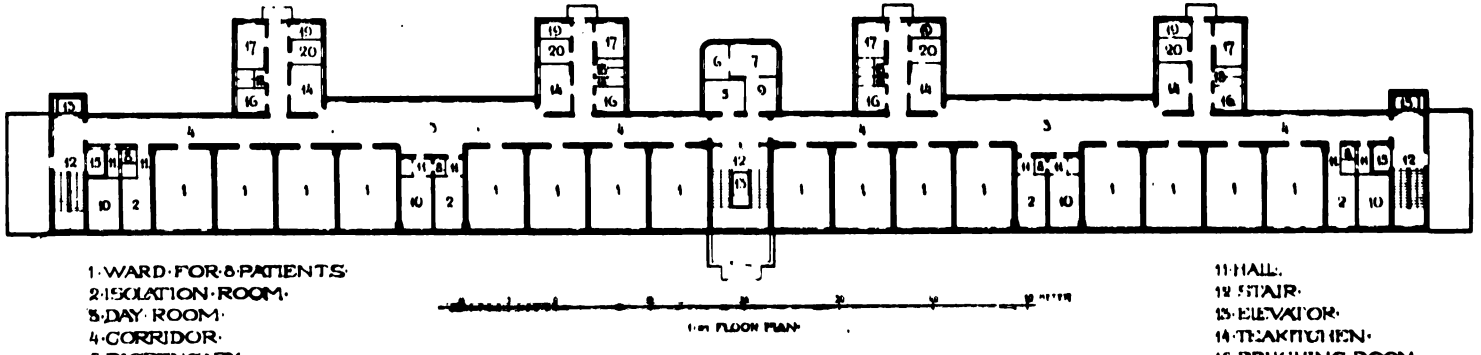
The above-mentioned 564 places for consumptive patients in the hospitals of Stockholm are far from being sufficient for the present want. In a report of 1904, Dr. Ivar Andersson, First Medical Officer of Health, pointed out that the best way of solving this so important question would be to erect a hospital in the country near Stockholm containing at least 400 beds for consumptives; at that hospital all stages of the disease should be admitted; Dr. Andersson contends that there cannot be any serious objection to this arrangement with regard to sanitary matters, as the treatment is principally the same in a sanatorium and in an hospital.

And in fact the Town-council of Stockholm has followed that advice and resolved on the erection of a hospital for all sorts of consumptives in the vicinity of Stockholm at Söderby; the building is to contain 408 beds in general ward and 40 in private or semi-private room; besides there will be two summer-pavilions for 56 patients. The cost for this magnificent institution is calculated for buildings, electric lighting, heating- and water-supply, construction of roads etc. at 1,996,000 Kronor, or more than 4,000 Kronor per bed, and in addition 200,000 to 225,000 Kronor for furniture. The expense of maintenance is estimated at 336,000 Kronor per year.

The hospital is now being built and it will be finished in 1910.

Söderby Hospital near Stockholm.

Söderby Hospital. Chief-building.



1·WARD·FOR·8·PATIENTS·
2·ISOLATION·ROOM·
3·DAY·ROOM·
4·CORRIDOR·
5·DISPENSARY·
6·DARK·ROOM·
7·EXAMINING·ROOM·
8·MEDICIN·CABINET·
9·ORDERLIES·ROOM·
10·NURSE·ROOM·

11·HALL·
12·STAIR·
13·ELEVATOR·
14·TEAKITCHEN·
15·BRUSHING·ROOM·
16·DISHWASHING·ROOM·
17·TOILET·
18·W·C·
19·ROOM·FOR·SOILED·CLOTHES·
20·STORES·

THE·SÖDERBY·SANATORIUM·OF·STOCKHOLM·

OTHER TOWNS.

Since 1903, there exists, at *Uppsala* a pavilion for 46 consumptives; this pavilion, which has been built on the municipal hospital's grounds, has cost about 75,000 kronor.

As this pavilion soon proved quite insufficient for the need, the county-branch of the Swedish National Anti-Tuberculosis Association resolved on the erection in the country of a new, smaller home for consumptive patients. To that end a property with 2 dwelling-houses was bought from the estate of *Vattholma.* The National Association gave a subvention of 7,000 Kronor and, moreover, granted a loan of 5,000 kronor. This Home can receive 14 patients.

Since 1905 an *anti-tuberculous dispensary* hus been in operation at Uppsala.

At *Göteborg* the consumptive poor receive treatment partly in a special hospital-building with 80 beds at the charitable institution "Gibraltar," partly at the Home for tuberculous persons, which contains 60 beds. At the "*Haralds minne*" (in commemoration of Harald) near Alingsås there are 12 beds for consumptive women of Göteborg.

From a fund—the Renström Fund—300,000 Kronor has been guaranted for the erection of a hospital for consumptives containing 168 beds, and at the *Sahlgren Hospital* a tuberculosis department will soon be established.

In the spring of 1906, a *Children's Home* was opened at *Sparfvebo*, which receives 15 healthy children belonging to families affected with tuberculosis. In this Home children from 3 years are taken care of until the sick member or members of their respective families have gained admittance at some institution for consumptives. The Home, which is situated in an outskirt of the town, is maintained by means of private charity. Another home of the same kind for 30 sound children of Göteborg has been opened at Räflanda.

Since 1903 a summer-sanatorium is in operation at *Sandarne*, 20 minutes from the terminus of the Göteborg tramway. The town granted free grounds and the Board of Health put at the disposal of the enterprise 2 barracks, which are used as store-houses and, in bad weather, as a refuge. The establishment of this sanatorium is due to private benevolence in cash and in kind. The number of beds is 50. The maintenance is very cheap, the boarding-cost being about 60 öre per day, and all the other expenses so low that each patient scarcely costs more than 1 Krona per day.

An *anti-tuberculous dispensary* is at work since 1906.

In the town of *Nyköping*, 50,000 Kronor have been endowed for the erection of a hospital for consumptives with 20 beds.

At *Norrköping*, the Board of Health in 1905 carried out a project for the building of a hospital for consumptives at all stages of the disease; containing 50 beds, it was calculated to involve, without furniture, an expense of 300,000 Kronor. A summer-pavilion with 23 places was opened in 1906.

At *Malmö* a rather large number of consumptives receive treatment at the Municipal Hospital or at the Provisional Hospital.

In most of *the other Swedish towns* the consumptives are nursed at the municipal hospitals or in the infirmaries of the Board of Charity; in many towns, however, special hospitals for the treatment of tuberculosis are already planned or projected. In many places donations have been given for that purpose, viz: 50,000 Kronor at Nyköping, 50,000 Kronor at Vexiö, and, moreover, 20,000 Kronor for the establishment of a hospital for the consumptives of the province of Vexiö, 25,000 Kronor at Vänersborg, 17,000 at Trollhättan, 13,000 at Alingsås, 12,000 at Åmål; 50,000 Kronor have been allotted for sanatorium treatment in the province of Vestmanland, 10,000 kr. for the fight against tuberculosis at Arboga, 2,200 Kr. for the erection of a home at Norberg, 5,000 Kr. for a hospital at Strömstad, 3,000 Kr. for one at Uddevalla, and so on.

The bill recently passed in by Parliament with regard to loans free of interest granted by the State in order to further the foundation of institutions for the treatment of tuberculosis will certainly be of the greatest avail to the respective communities, and

no doubt, small, but not to small, and good homes for consumptives will soon spring up all over the country. As for the particulars regarding the above mentioned bill I refer to the article of Dr. Buhre in this work.

Summer-sanatoria are in existence at Falun, Sundsvall, Vesterås, Köping, Venersborg etc.; *anti-tuberculous dispensaries* are at work in a great many towns.

PRIVATE SANATORIA.

Of late years several private sanatoria for wealthy people have been established; the oldest of those institutions was opened in 1891, at *Mörsil* situated in the province of Jemtland.

It consists of 48 private rooms distributed among 4 villas and possesses, moreover, a large hotel, which contains comfortable sitting-rooms and the dining-room. The average number of patients is about 150 per year.—Besides, there are at Mörsil another private sanatorium "*Didron's Home*" for 20 patients, and for less well off persons "*Fredhill's Home*" and "*Hagberg's Home,*" each for 10 patients.

Säfsjö, in the province of Småland, possesses a private sanatorium with 90 beds. This place being already in 1870 a favourite sojourn for a great many consumptives, a small sanatorium was built, which building was later enlarged and accommodated for the 90 patients it can now receive.

At *Romanäs* near Tranås a first-rate sanatorium for 60 patients has been opened recently; smaller private sanatoria are in operation at *Sundsholm* and at *Ahlefors,* both places situated in the vicinity of the town of Halmstad.

Small private homes for consumptives are in existence all over the country—as for instance *Bäcka.*

SANATORIA FOR WORKMEN.

Of late years several industrial companies have constructed hospitals in behalf of their consumptive workmen. The great L[td] Com-

Romanās Sanatorium.

Romanās Sanatorium. The Hall.

pany "Separator" opened such a hospital on April 1st 1900; the buildings had cost 90,000 Kronor, the fnrniture 16,000 Kr. During 1901—1905, 110 patients at all stages of the disease were nursed in this hospital.

The *Bälteberga* Sanatorium, belonging to the Match-manufacturing Company Ltd "Vulcan" was opened on April 1st 1901; it contains 18 beds. The sanatorium was installed in an old building, which

The Bäcka private Sanatorium.

for the purpose was altered and enlarged. The total attendance during 1901—1905, was 132 patients.

The *Countess W. von Hallwyl's Sanatorium* at Mörsil which was opened in 1901, contains 17 beds, and is destined for the nursing of the tuberculous workmen and their families of the Ljusne-Voxne Wood Company Ltd. The expenses for the erection of this sanatorium have been about 10,000 Kronor.

In November 1905 the *Sandviken Hardware Company* opened a home for the tuberculous workmen of their factories; this home

Hemgården privat Sanatorium.

is chiefly destined for patients at an advanced stage of the disease. The workmen themselves don't pay anything, but the members of their families have to pay 50 öre per day. There are 20 beds. The cost for the erection amounted to 65,000 kronor.

The *L. M. Eriksson's Telephone Company L^td^* has erected a sanatorium with 15 beds at *Mogetorp* in the vicinity of the Hålahult popular sanatorium in behalf of the tuberculous workmen of their factories. This sanatorium has cost 60,000 Kronor. The

Grängesberg Sanatorium for workmen.

married workmen receive nursing gratis, the bachelors have to pay 1 krona per day.

The *Stora Kopparberg's Company* has built a sanatorium at *Domnarfvet* with 20 beds for their workmen and, moreover, founded a summer-sanatorium for the same purpose.

The *Grängesberg Company L^td^* has erected a hospital for consumptives with 16 beds; the *Grycksbo Paper-manufactory* has built a sanatorium for their workmen; the *Luossavara-Kirunavara Com-*

Styrsö Sea Sanatorium for scrofulous children.

The Crown-Princess Victoria's Sea Sanatorium for Scrofulous Children on Skeldervik.

pany has decided upon the foundation of a sanatorium at Kiruna for 16 patients.

SEA SANATORIA FOR CHILDREN.

Of the Sea Sanatoria for Scrofulous Children that of *Styrsö* is the oldest one. In 1890 a colony of about 20 children were sent there. At present about 70 scrofulous and tuberculous children are nursed at that sanatorium the whole year round in a modern and comfortable building.

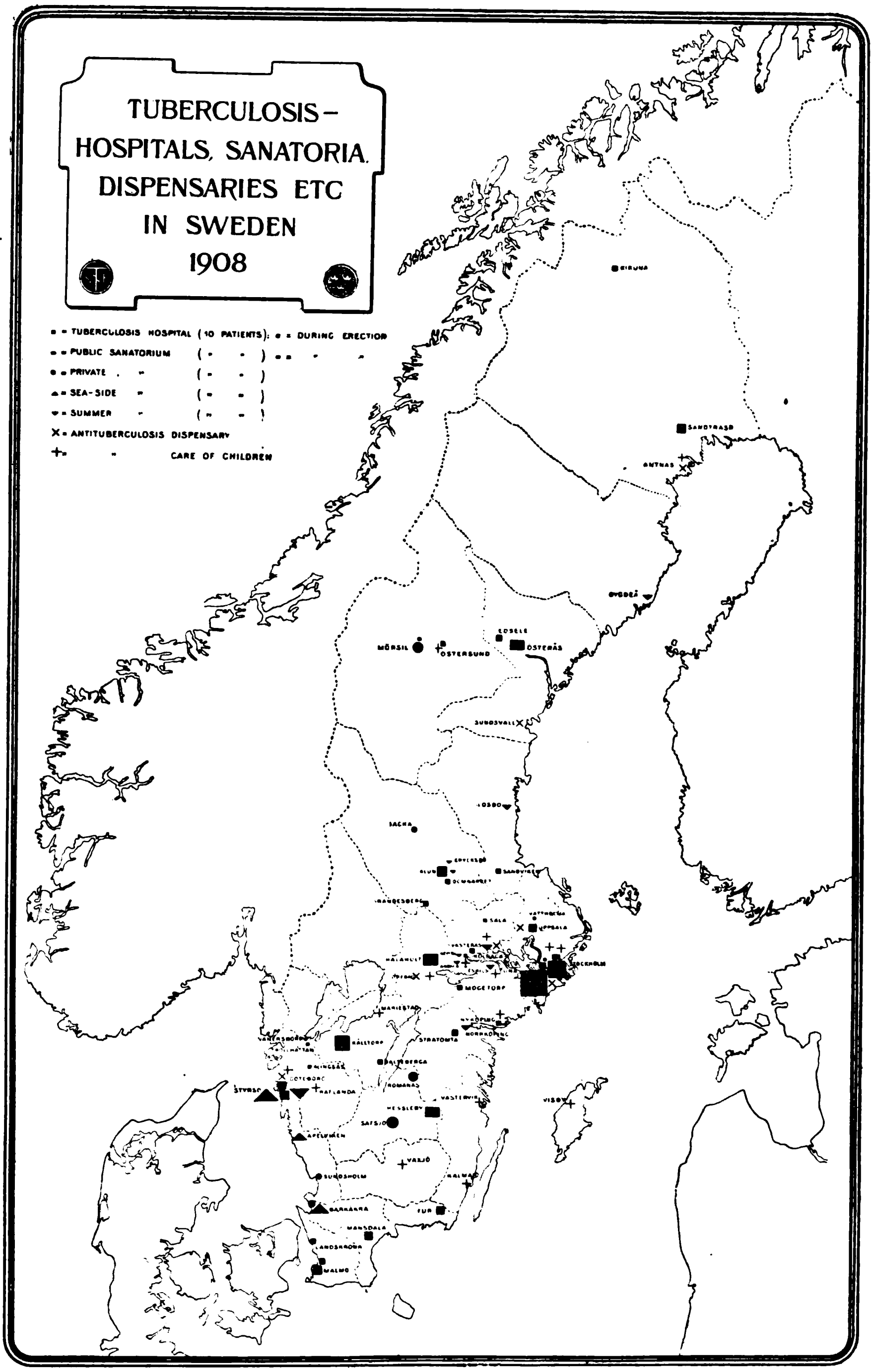
The *Crown-princess Victoria's Sea Sanatorium* on the Skeldervik was brought about by a bazaar, at which a sum of 70,000 Kronor was collected. This amount was delivered to the recently founded Association for the Nursing of Scrofulous Children. A building project was formed according to which this sea sanatorium should consist of an administration building, an engine-house, a bathing establishment and the proper hospital-building. The administration building was erected first and was then temporarily used as a sanatorium, the next year the engine-house was built. The institution can now receive 70 patients. A government grant of 200,000 Kronor has been made for the achievement of this sanatorium. In its final state it will be able to accommodate 150 patients.

The sea sanatorium "*Hälsan*" (Health) at Bygdeå, province of Vesterbotten, has since 1900 been open during 2 to 3 months every summer and can receive 12 to 13 children.

The *Apelviken* sea sanatorium belongs to and is maintained by the Association for the Nursing of Scrofulous Children at Varberg and is open from May till September every year It consists of an outdoor sleeping pavilion with 24 beds and a kitchen. The cost for building and furniture has been 5,000 Kronor. It can receive 50 patients.

Apelviken Sea Sanatorium.

Apelviken Sea Sanatorium.


TUBERCULOSIS – HOSPITALS, SANATORIA, DISPENSARIES ETC IN SWEDEN 1908
= TUBERCULOSIS HOSPITAL (10 PATIENTS); = DURING ERECTION
= PUBLIC SANATORIUM (" ")
= PRIVATE " (" ")
= SEA-SIDE " (" ")
= SUMMER " (" ")
X = ANTITUBERCULOSIS DISPENSARY
+ = " CARE OF CHILDREN

THE INFECTIVITY OF CONSUMPTIVES' CLOTHES,

BY

RAGNAR FRIBERGER, M. D.,

REPORT FROM THE UPSALA UNIVERSITY' PATHOLOGICAL INSTITUTE

(Direktor: PROFESSOR ULRIK QUENSEL.)

THERE seems to be every probability that the clothes of people suffering from consumption become infected with the germs of the disease. It has also been very generally considered that such clothes are infectious, not only by medical men in recent years but also by the people at large in many places (in Portugal, Vienna, etc.) and this even before KOCH'S great discovery.

Experimental investigations, however, as regards the infectivity of consumptive patients' clothes do not appear to have been recorded. At all events, if there are accounts of any such experimental researches to be found in medical literature, they have not called forth much attention or become generally known. The series of experiments here to be described deal with this question of the infectivity of a consumptive patient's clothes. The method pursued has been as follows: — The clothes have been cleaned as thoroughly as possible by means of a vacuum cleaner, and the dust and dirt removed from them has then been tested for tubercular bacilli by inoculations on animals.

The vacuum cleaner employed is a hand-power one of Swedish construction. The speed at which the cleaner was worked for these

experiments was almost three times as great as that prescribed for ordinary cleaning of rooms. The mouthpiece of the sucker is slit-shaped, 15 by 0.4 centimetres large and with somewhat rounded edges. With this mouthpiece every section of the clothes to be examined was scoured over 20 or 30 times to and fro, especial attention being paid to the openings for pockets and the parts round and about buttons and buttonholes. The mouthpiece of the sucker was pressed as hard against the clothes as the strength of the operator would permit. Hence, it is to be taken for granted that any dust which was at all loosely attached to the clothes was removed in the process. On the other hand, there were some stains on the cloth which withstood all efforts to remove them by the cleaner. Consequently, for the later experiments, any stains of that kind were scraped off by means of a sterilised sharp instrument previous to the application of the cleaner. Even, however, when that was not done, the upper coat of the stains at any rate had been undoubtedly removed in the dustsucking process.

The clothes examined were coats, waistcoats, trousers, woollen vests, dresses, bedspreads. It was sought to discover in each case, by taking due regard to the patient's habits etc., which garment would be the most likely to be infected and this was of course selected for the experiment. As a rule the garment selected had been in wear for a month or two. In one case a bedspread or counterpane was tested with positive result which had only been used for 10 days. The clothes were subjected to the cleaning process directly they came from the patient; now and again it proved impossible to carry out the experiment without the delay of a day or two, but in every such exceptional case the clothes were rolled up tightly, wrapped in paper, and put away in a place where no sunlight could reach them.

The quantity of dust obtained from the clothes varied very considerably in amount. The dust was collected in the tube of the vacuum cleaner (which was carefully cleaned and disinfected between each two experiments). The end of the tube was stopped up with sterilised cotton-wool. In some of the experiments there was as much as from 50 to 100 cubic centimetres of dust collected,

weighing about 2 grammes or more, in others there was so little dust as only to impregnate the outermost layer of the cotton-wool.

As it proved impossible to demonstrate the presence of tubercular bacilli in the dust extracted from the clothes by means of any colouring method there was no avoiding having recourse to inoculation on animals. The dust, or that portion of the cotton-wool which had become impregnated with the dust, was shaken up thoroughly for 5 minutes with from 15 to 30 cubic centimetres of sterilised bouillon. Then the coarsest particles of dust were strained off by means of a double layer of sterilised gauze. The liquid was then used for intraperitoneal injection on two guinea pigs. In some of the experiments the whole of the liquid could not be injected, for fear of causing acute infection which, as a matter of fact, killed many of the animals experimented on prematurely. When the liquid had to be divided, however, care was taken to shake it up well previously, so that the infectious matter might be homogeneously dispersed throughout the whole of it. Moreover, in the most recent of my experiments I was able to use all or almost all the liquid, as I carried out the inoculation at twice, the dust being divided into two equal portions. One was used at once for inoculation in the ordinary way, the other was kept for some days in a refrigerator, to be injected in its turn after the animal had recovered from the acute effects of the first injection, if such there were. In some experiments the liquid not used for injection was diluted and employed for spraying guinea-pigs. The method in this case is one described by O. V. Petersson (Clinical Experimental Studies on Tuberculosis of the Lungs, Nord. Med. Arkiv, Vol. for 1900, Nos. 30 and 33). In other experiments again spray-treatment alone was tried.

Twelve different samples of dust derived from eleven consumptive patients were made the subject of examination. With three of these samples, all of them introduced by intraperitoneal injection, positive results were obtained, with nine negative ones. Both in these negative experiments and in some previous ones the breed of animal employed showed itself to be free from spontaneous tuberculosis, dissections made of the specimens that died within a few days of the inocula-

tion proving that conclusively. Moreover, in the cases with positive results the tuberculosis was chiefly peritoneal (the oment thickened and permeated with tubercles, miliary eruptions on the parietal peritoneum etc.). As the tubercular nature of the changes was furthermore evidenced by the presence of KOCH'S bacillus in slices from the organ, it may fairly be assumed that the positive cases have been authentically established.

As regards the negative cases, they do not of course prove with the same certainty that the clothes examined were not infected with tubercular bacilli. That is particularly the case with regard to those investigations where the spray-method only was employed. Professor O. V. PETERSSON has, it is true, succeeded in infecting guinea-pigs by this method with extremely small quantities of matter containing tubercular bacilli as for instance, with the thin layer of moisture remaining on a glass disk of 10 × 17 centimetres in size, which a consumptive patient had held at 10 or 15 centimetres' distance from his mouth when coughing. GEBHARDT also, it is true, succeeded some time ago in infecting guinea-pigs by the spray-method with 100 cubic centimetres of sputum diluted, to the extent of 1 in 100,000 (VIRCHOWS Archiv, Band 119, Heft 1). But as it cannot be more than a small portion of the liquid sprayed that the animal inhales or swallows, I am only able from the three experiments carried out solely by the spray method to draw the conclusion that the dust from the clothes cannot have contained tubercular bacilli in large quantities.

As regards the six experiments, on the other hand, where the testing was carried out by the peritoneal inoculation method, but which resulted negatively, one may make the following remarks. There were in some cases stains upon the clothes which could not be wholly removed by the cleaning process, but nevertheless their superficial layers were sucked up by the apparatus; furthermore, the whole of the dust was not employed in the intraperitoneal injections though it may be observed that the material was made as homogeneous as possible before being divided. Finally, I must remark that, to my regret, I was unable, owing to want of animals, to carry out secondary experiments on fresh animals from some of those I had

inoculated primarily. Some of the latter displayed on dissection certain pathologico-anatomical changes which might be considered as the result of the inoculation, such as swollen, retro-peritoneal glands'small abscesses in the abdomen, infiltrations of the liver etc. situated near the place of inoculation. In those cases microscopic researches were made afterhardening of the suspected parts of the organs, and search was instituted in numerous slices for tubercular bacilli, but in spite of the fact that these researches proved to be negative in their results, secondary inoculations would have been desirable in the light of our knowledge regarding the so called latent presence of tubercular bacilli in the animal organisms. It is not, however, probable that a tubercular taint would have been able to keep its latent character in *all* parts of the organism for the length of time the guinea-pigs lived after the injection, viz. from 2 to 4 months.

Even though the conclusiveness of the negative results cannot be considered complete, yet it is interesting to note how those patients, the clothes of which appear not to have been infectious, differ, from a clinical point of view, from the others. Two of those were in the second stage of the disease — following TURBAN'S classification — had only little sputum and were in the habit of observing the usual precautions regarding it. The three other cases were, it is true, in the third stage of the disease, but they belonged to the one among the very divergent groups constituting that stage, that differs least from the second stage. The patients were, moreover, possessed of good physical and mental powers and were all exceedingly cleanly in habit. One of them, whose sputum was very abundant and full of bacilli, was most scrupulous in following out to the letter the laws of hygiene. Two samples of dust out of clothes used by the patient were examined, one from a counterpane, another from a suit. Of the two remaining patients one was precluded from taking any precautions with his sputum, on account of his ignorance of the character of his disease up to the date of the experiment. Respecting the other, again, it is unknown whether or not he was acquainted with those precuautions wich are considered necessary as regards tuberculous sputum.

Though these patients were of very different characters, there was this point in common to them all, that they were remarkably cleanly, although — and that must be taken into consideration when judging of this — they all belonged to the labouring classes.

The samples of dust, on the other hand, that yielded a positive result, were from three consumptive patients in the last stage of the disease shortly before death when debility and indifference caussed want of cleanliness. One of the invalids had still strength enough to be out of bed and dressed during a portion of every day. In his case his clothes were examined. The other two were confined to their beds; in their cases their counterpanes were tested. One had had the same counterpane for several months; only one third of it was subjected to the vacuum cleaning process, but the dust from that portion was nevertheless quite sufficient to convey infection. The other patient had only had his counterpane in use for 10 days.

Summarily — as far as a conclusion may be drawn from these few experiments and with some hesitation regarding the reliability of the negative results, it seems, that a rigid observance of the hygiene of tuberculosis concerning the sputum and even indeed a strict cleanliness in the ordinary sense, will suffice to protect the clothes of a consumptive patient from being infected with tubercular bacilli. But, on the other hand, the neglect of these rules is proved to result in the clothes becoming infected with the tubercular taint.

AN INQUIRY AS TO WHETHER OR NOT THE TUBERCULOSIS TAINT CAN BE ACQUIRED BY THE INHALATION OF DUST CONTAINING TUBERCULAR BACILLI

BY

PROFESSOR JOSEF SVENSSON.

REPEATED experiments have been made and many discussions held with a view of ascertaining what are the most usual ways in which the tuberculosis taint is transmitted from one individual to another, without however any very definite conclusions on the matter having been hitherto arrived at. It may be taken for granted that all investigators are now agreed, that the question as to the most ordinary ways in which infection is conveyed resolves itself into establishing whether the taint enters the system more usually through the organs of respiration or through those of digestion. Other channels of invasion, such as the skin or the generating organs, do not come into practical consideration. As regards the respiratory organs, infectious matter may be inhaled into the lungs either along with specks of dust, or in the form of small particles of the sputum coughed up by consumptive persons. The digestive organs, again, are exposed to invasion in two ways: the infectious matter may be concealed in portions of food consumed, or it may have been inhaled and lodged in the throat, to be swallowed down later along with the saliva or food. Another theory is that the tubercular bacilli which may be inhaled or otherwise find their way into the mouth, lodge in the mucous membrane of the throat, and that they are then absorbed by the lymphoid organs situated there and conveyed thence to the lungs and other parts of the body.

On the strength of the arguments and experiments cited in support of each one of the above theories we can scarcely do other than conclude that all these ways and possibilities for infection to enter the body are existent, and it only remains to find out which are the most and which are the least frequent. If we are to believe Messrs. Calmette and Guérin, Vallée, Barthel and others, i. e. the majority of investigators who have published results of experiments in this field, tuberculosis almost always occurs as the result of tubercular bacilli which have found their way into the alimentary canal, though they make their presence known first in the form of tuberculosis of the lungs or pulmonary lymphatic glands. The possibility of tubercularly infected dust or particles of consumptive persons' sputum penetrating direct into the lungs is regarded as altogether out of the question. The earlier experiments yielding positive results, by Tappeiner, Cornet and others, and the more recent experiments of Flügge, Cadéac, Nocard, Rossignol and others, are not considered reliable, since according to Calmette neither dust nor microscopic particles of sputum can find their way into the lungs with the air inhaled. The fact of the lungs having been attacked by the germs in the experiments carried out by the investigators named, is due, as was the case with Calmette's own experiments, to their having got there by round-about ways, through the mucous membrane of the intestinal canal, the mesenterial lymphatic glands and lymphatic ducts to the vena cava, and finally through the right half of the heart into the lungs. In a few cases, where a direct infection of the lungs is admitted to have taken place, the experiments were carried out with such a large quantity of infectious matter, or under conditions as regards the animals experimented on that were so markedly divergent from the normal, that the experiments cannot on that account be considered to prove anything conclusively.

Personally I felt convinced ten years ago that the tuberculous infection could not be acquired by the inhalation of dust containing tubercular bacilli, and that opinion I continued to hold until I began to endeavour to test whether it was correct or not. My experiments, according to my opinion, resulted in a demonstration

of the exact opposite, that is to say of the ease with which animals could be infected by dust containing tubercular bacilli. The experiments,* it is true, were not carried out with a sufficient degree of scientific thoroughness to be perfectly conclusive, though on myself the effect they produced was convincing and I was encouraged to pursue the investigation. (For the Tuberculosis Congress held at Vienna in 1907 I drew up a report — printed in the "Bulletin de la ligue Suèdoise contre la tuberculose", 1907 — upon the statistics to hand concerning the prevalence of tuberculosis in cattle and pigs slaughtered at the slaughtering-house in Malmö during 1905.)

The results to be seen from the tables are in brief that, if cases of general tuberculosis are excluded and only those of local tuberculosis included, the lungs and their lymphatic glands were found to be attacked in 99·67 % of the cases in cattle and in 69·02 % of those in pigs. Now seeing that, as is generally admitted, pigs only absorb the infectious matter in their food, unboiled milk and its products, it follows that, as regards cattle, the absorption of the infection must take place in other ways as well, that is by inhalation.

Even though experiments made earlier and statistics already collected may be held to prove it probable that a direct infection of the lungs by means of dry dust does actually take place, they cannot be said to afford scientific proof of the fact. In order, if possible, to arrive at that I have carried out the experiments to be here described.

A wooden cage was constructed in such a way as to allow of rabbits being placed in it with their bodies in the hinder part of the cage and with their heads projecting into the front part through semicircular holes in a partition wall, the holes being made just large enough for their necks to rest comfortably in them but not so large as to allow of the rabbits withdrawing their heads through them. Four rabbits were placed in this cage on August 20, 1907, at 8 o'clock a. m., with their heads and ears bound up in Mosetig's batiste, so that only their noses were left uncovered. Strips of paper were pasted over all the chinks in the cage except on its front face, which was constituted of a shutter sliding up and down. At

* See La Lutte contre la Tuberculose en Suède, for the Congress held in Paris in 1906.

the two sides of the cage there were two round holes for the admission of air, closed with pads of wadding. On the floor of the cage towards the front beneath the rabbits' heads, an india-rubber pipe of very small diameter had been fixed, in which a row of minute holes were made by means of an incandescent needle. This pipe was connected by glass tubes and another longer india-rubber pipe with a blast, which could thus be located at several metres' distance from the cage.

About 5 milligrammes of tubercular bacilli, taken from a strongly virulent culture of typus bovinus, were dried first with blotting-paper and then for a whole night over sulphuric acid in vacuum. On the following morning, the 20th of August, the bacilli were mixed together with about one table-spoonful of lampblack, which had been dried at a temperature of 150° Celsius and been allowed to cool down. The pulverization of the lampblack and the tubercular bacilli, to ensure their becoming thoroughly mixed, then took place, all necessary caution being duly observed. The mixture was spread out on the floor of the cage in a long line under the rabbits' heads and near to the perforated india-rubber pipe. The shutter in front, which consisted of a pane of glass in a wooden frame, was lowered and closed, the cracks all round its edges being pasted over with strips of paper. By aid of the blast a short but strong current of air was forced into the cage, causing the dry, dust-like powder to rise suddenly in a cloud, so that it was perfectly evident that the air in the front part of the cage was teeming with particles of the black dust. This was repeated a few times during the course of the next quarter of an hour. Then one rabbit was extracted and killed immediately by a stab in the back of its neck. Its skin was flayed off and the following parts of the body were removed and sterilised: the lungs, the throat, one submaxillary gland, the stomach, a portion of the intestinal canal (the duodenum), and the mesenterial glands;* these different parts were deposited in separate sterilised Petri basins. Injections were subsequently made upon guinea-pigs with the material mentioned so soon as time could be found for doing so. (See description below.)

* No bronchial or mediastinal glands could be discovered in either this or the other rabbits.

An examination of the throat and stomach of rabbit No. 1 showed that the throat contained mucus dyed with lampblack and that the contents of the stomach in the vicinity of the cardiac opening were also blackened in appearance. The three remaining rabbits were left in the cage till half past ten the same morning, when they were extracted. One was killed on the spot and dealt with in the same way as No. 1, the parts removed from the body and sterilised being: the submaxillary glands, the lungs, the throat, one mesenterial gland, the stomach and the duodenum. The throat and stomach of this rabbit too were found to contain black dust (lampblack).

On the following day (Aug. 21) at half past ten, the third rabbit was killed and the following parts were removed from its body and sterilised: the lungs, the throat, a front mediastinal gland, submaxillary glands, the stomach, the duodenum, and one mesenterial gland. Injection upon guinea-pigs was effected at once. No coal-dust was to be perceived in the throat or stomach or intestinal canal.

Rabbit No. 4 was wiped clean, not only on the nose and head — that had been done with the other three rabbits — but also all over its body. It was then placed in the cage, where it remained until it died on Sept. 21st, 32 days after the inhalation. The result of the injections is to be seen from the table to follow.

\+ = *tuberculous;* — = *non-tuberculous;* 0 = *no result.*

NO.	MATTER INJECTED	DATE OF KILLING	RESULT	FACTS REVEALED BY DISSECTION
	GUINEA-PIG RECEIVED SUBCUTANEOUS INJECTION ON THE LEFT SIDE OF THE STOMACH ON AUG. 20, 1907 FROM RABBIT No. 1, KILLED IMMEDIATELY AFTER THE INHALATION.			
1	Mucous membrane from throat	9.X.	+	Tuberculous ulcers at point of injection; inguinal gland like a small hazel-nut, with two large caseous tuberculous nests.
2	» »	9.X.	+	Tuberculous ulcers at point of injection; inguinal gland as large as a hazel-nut; mattery disintegration in it; in the spleen two tuberculous nests of the size of hemp-seeds.
3	Portion of lung, from lower lobe of right lung		0	Died on 31st of August, 11 days after injection, from intercurrent disease.

No.	Material injected	Date of killing	Result	Facts revealed by dissection
4	Portion of lung, from lower lobe of left lung	9 X		Tuberculous ulcers at the point of injection; inguinal gland as large as a small hazel-nut, with three caseous tuberculous nests. In the spleen a number of caseous tuberculous nests of the size of a small pea, in the liver about 15 similar ones of the size of a hemp-seed.
5	Portion of lung, from front [illegible] lobe	9 X		Small ulcers at the point of injection; tubercles in the inguinal glands on either side, on the left as large as an almond, disintegrated in the centre, on the right [illegible] as a pea with disintegration. In the spleen 4 tuberculous nests of the size of hemp-seeds and some smaller ones.
6	[illegible]	9 X		Ulceration of the size of a pea at point of injection; inguinal glands on left side of the size of an almond, with tuberculous nests of the size of a pea. In spleen 7 tuberculous nests of the size of hemp-seeds and some smaller ones.
	[illegible]	9 X		Nothing at point of injection. Tubercles in left inguinal gland [illegible] elsewhere.
		9 X		[illegible] point of injection [illegible] Tubercle in left inguinal gland. Tubercles in spleen and liver. In the spleen and liver a few tuberculous nests in the latter.
	[illegible]	9 X		[illegible] a fortnight after the injection. Numerous small abscesses in the liver and spleen. No tubercles.
	[illegible]	9 X		[illegible] tubercles
	[illegible]	9 X		[illegible]
		9 X		[illegible]
				[illegible]
				[illegible]
				[illegible]
				[illegible]

NO.	MATTER INJECTED	DATE OF KILLING	RESULT	FACTS REVEALED BY DISSECTION
17	Portion of lung, from right front lobe	21.X.	+	Tuberculous ulcers at point of injection; left inguinal gland of the size of a hazel-nut, tuberculous; spleen fairly large with two tuberculous nests. None elsewhere.
18	Portion of lung, from left front lobe	21.X.	0	Died Aug. 23rd, two days after injection.
19	Mucous membrane of throat	21 X.	+	No ulcers; left inguinal gland large, tuberculous. Spleen enlarged, not tuberculous.
20	Blackened membrane of throat	21.X.	+	Large tuberculous ulcers: left inguinal gland as large as a nut, tuberculous; right, nothing. Spleen nodose with tubercles. One lumbar and one mediastinal gland swollen with tubercles.
21	Portion of a mesenterial gland	21.X.	0	Died Aug. 26th, 6 days after injection.
22	» »	21.X.	+	No wound at point of injection; left inguinal gland large, tuberculous; right, nothing, nor elsewhere.
23	Contents of intestines from duodenum	21.X.	—	No tubercles.
24	Contents of intestines from duodenum	21.X.	+	No ulcers; tubercles in left inguinal gland. Small tuberculous nest in the spleen. None elsewhere.
25	Contents of stomach	21.X.	+	Tuberculous ulcers at point of injection. Inguinal glands swollen, tuberculous. A few tuberculous nests in the spleen. Lumbar and mediastinal lymphatic glands, tuberculous.
26	» »	21.X.	+	Tuberculous ulcers. Two flank glands of size of nuts, tuberculous. Tubercles in the spleen, liver, lumbar and mediastinal glands.

GUINEA-PIG GIVEN SUBCUTANEOUS INJECTION ON LEFT SIDE OF BELLY ON AUG. 21, 1907 FROM RABBIT No. 3, KILLED 26 HOURS AFTER INHALATION.

27	Portion of lung, from right lower lobe	21.X.	+	Tuberculous ulcers at point of injection; left flank gland of the size of a hazel-nut, tuberculous. Tuberculous nests in the spleen, mediastinal and lumbar glands.
28	Portion of lung, from left lower lobe	21.X.	+	Tuberculous ulcers in left inguinal gland. Said gland of the size of a nut. Tuberculous nests in the spleen, the lumbar and the mediastinal lymphatic glands.
29	Portion of lung, from right front lobe	21.X.	+	No ulcers at point of injection. Flank glands on both sides of the size of nuts, tuberculous. Tuberculous nests in the spleen and the lumbar gland.

NO.	MATTER INJECTED	DATE OF KILLING	RE-SULT	FACTS REVEALED BY DISSECTION
30	Portion of lung. from left front lobe	21 X.	+	Tuberculous ulcers at point of injection. Tubercles in the left flank gland. in the spleen, the lumbar and mediastinal glands.
31	A front mediastinal gland.	21.X.	—	No tubercles.
32	» »	21.X.	—	» »
33	Mucous membrane from throat	21.X.	—	» »
34	» »	21 X.	—	» »
35	Submaxillary gland	21.X.	—	» »
36	» »	21.X.	—	» »
37	Mesenterial gland.....	21.X.	—	» »
38	» »	21.X.	—	» »
39	Contents of stomach	21.X.	—	» »
40	» »	21.X.	—	» »
41	Contents of intestines from duodenum	21.X.	—	» »
42	» »	21.X.	—	» »

Rabbit No. 4 died on Sept. 21, 32 days after the inhalation; tuberculosis of a high potency manifested with convergent, yellow irregular tuberculosis induration of the lungs. No tuberculosis anywhere else. The bronchial and mediastinal lymphatic glands could not be found.

As may be seen from the table, all the 10 guinea-pigs that had portions of the lungs of the three rabbits injected into them, were infected with tuberculosis the two guinea-pigs that died prematurely of intercurrent diseases are not taken into account.

The guinea-pigs into which were injected the mucous membrane of the throats and the contents of the stomachs of rabbits 1 and 2 were infected. Similar material from rabbit No. 3 did not produce infection.

Of four surviving guinea-pigs into which matter from the mesen-

terial glands of the three rabbits was injected, only one was affected with tuberculosis and that to a small extent.

Of six guinea-pigs into which were injected the contents of the duodenum, one was infected with tuberculosis. That one received an injection from rabbit No. 2. In rabbit No. 1 the infectious matter had not penetrated so far as to the duodenum, in No. 3 on the other hand it had already passed through that portion of the intestines.

Of the four guinea-pigs into which were injected the submaxillary lymphatic glands of rabbits Nos. 2 and 3, not one was affected with tuberculosis.

It is interesting to see a summary of the results of the injections with the lymphatic glands of the three rabbits, especially rabbit No. 3.

Out of ten guinea-pigs that survived after having injections with lymphatic glands, only one got tuberculosis. I should be inclined to suppose that even in the case of that one the disease was caught afterwards or through some impurity reaching it in spite of every precaution in the injection. The occurrence of tuberculosis in only one lymphatic gland, without any tuberculous ulcers, points to the infection having taken place by means of a very small portion of infectious matter or to a subsequent, and in that case accidental, infection, e. g. in palpation of the inguinal glands. The fact of no infection having taken place at all from the lymphatic glands proves that the infectious matter did not reach them. In the case of rabbit No. 3, killed 26 hours after inhalation, that must have been due to the tubercular bacilli having been so virulent that they could not be attacked and absorbed by the rabbits' phagocytes. It is probable that the part played by the virulence of the infectious matter as regards the channels of infection and the localisation of the tuberculosis is often lost sight of.

Though the experiment might give rise to very many reflexions regarding the behaviour of tubercularly infected matter in the animal organism, I must content myself here with pointing out that in the experiments here detailed an entirely positive result was obtained in the problem to be solved, viz. the relation of the infectious matter

to the lungs. The rabbits experimented on were in a condition during the experiment to admit of respiration proceeding normally and quietly. Though the number of tubercular bacilli in this case was larger than would probably ever be present at one time to infect human beings or animals with tuberculosis, the time on the other hand during which the animals experimented on were exposed to the infection was proportionately shorter than would be the case in general. During the space of a day or two the lungs may probably absorb as large a number of tubercular bacilli in conjunction with dry dust as was the case here in 20 minutes. Two of the rabbits experimented on were killed so soon after the inhalation took place that the infectious matter actually had not had time to be swallowed, penetrate through the mucous membrane of the alimentary canal to the lymphatic glands, and pass thence by the ductus thoracicus to the vena cava, the right side of the heart and the lungs. The examination made of the lymphatic glands of the rabbits corroborated the assumption that such was the case. The infectious matter undoubtedly penetrated direct into the lungs in the ordinary process of breathing.

By the experiments described above I consider I have proved that under circumstances that do not materially differ from those in which both human beings and animals may sometimes find themselves, rabbits may be infected from dust containing tubercular bacilli through the dust having made its way direct into their lungs. The conclusion I drew from an earlier experiment (described in "La Lutte contre la Tuberculose en Suède" for the Paris Congress in 1906) is thus satisfactorily corroborated. In the experiment last mentioned, which I call practical in contradistinction to laboratory experiments, 13 calves known to be exempt from tubercular taint, were placed in a farmyard where tuberculosis was rife. They were protected as far as might be from imbibing tubercular infection with their food or from the expectorations of other animals. As all the calves took the infection in from six to twelve months, I regard that to have occurred by reason of the dust infected with tuberculous taint which they undoubtedly absorbed direct into their lungs.

From the statistical tables mentioned above (p. 167) of the occurrence of tuberculosis in pigs and horned cattle, it is clear that tuberculosis is acquired by cattle in the great majority of instances by inhalation.

The conclusions I consider myself entitled to draw from the results of the experiments here described and those I gave an account of in "La Lutte contre la Tuberculose en Suède" in 1906, and from the statistical tables for the Congress in Vienna in 1907 are:—

The tubercular tainted matter is readily absorbed into the lungs in a dry condition.

Direct infection of the lungs is the way in which tuberculosis most frequently makes its appearance in cattle.

A NEW METHOD OF STUDYING THE INFLUENCE OF TUBERCULAR PREDISPOSITION IN REGARD TO LIFE-ASSURANCE.

SUGGESTED BY THE SCANDINAVIAN COMMITTEE FOR AN EXAMINATION INTO THE QUESTION OF ASSURING NOT-NORMAL RISKS.

INTRODUCTORY REMARKS

BY

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A FRENCH author, in the standard work "Traité de médecine", begins a chapter "On the Heredity of Consumption" by the following statement: "The heredity of consumption is one of the most substantiated facts in pathology. Since the days of Hippocrates it has been well known, that a consumptive man often is the descendant of a consumptive man." All this sounds like a creed, and we are most of us ready to "jurare in verba magistri". But, since the contagiousness of consumption has been ascertained, there is no lack of different opinions, and there are many people who hold, that the so-called hereditary tuberculosis mostly is a tuberculosis "par contagion". In a family, where there is one consumptive member alive, it is easy to understand, how many opportunities of contagion there must be. The problem of heredity is not yet solved, and it must be admitted, that this problem is rather a

difficult one. No doubt, it is true, that tuberculosis may be transferred from a consumptive mother to her foetus, but observations of this kind (made by *Charrin, Berti, Merkel, Jacobi*) are so utterly rare, that they are of no value whatever for the solution of the problem of heredity in regard to practical life. It is also probable, that consumptive parents may breed weakly children, liable to get consumption; but the same is likely to be the case with parents suffering from other chronic cachexias. One does not know at all, however, what influence a patrimonial heredity may exercise taken as a whole, nay, one hardly knows whether such heredity has any influence at all.

From the daily experience that certain families are especially afflicted with consumption the conclusion is drawn, without further, that in such families there must be a natural disposition to the disease in question. True it is, that in a family where one of the parents is suffering from consumption, it often happens that some child or other contracts the disease. But such an observation by no means proves the existence of a general predisposition within the family and still less that the disease has been inherited. It may be possible that the father or the mother has contracted the disease by contagion and that they in their turn have infected some of the children, though there may never be heard anything, neither before or after, about any such disposition within the family. If so, one is scarcely justified in considering the said cases of consumption as due to any special predisposition. Unless the children had been exposed to the contagion in their nearest surrounding, from father or mother, perhaps they should never have caught consumption.

To my view the above mentioned statements are of a slight value, because they are based upon a false method of investigation. It is false to refer to consumptive or otherwise tuberculous people, trying to get information about their family relations, making inquiries about their brothers and sisters, their parents or near relatives, and if anyone of those is or has been tuberculous, to take this fact as evidence of the existent family disposition. But that is a wholly absurd way of proceeding, when the question is to find out

whether, in regard to the propagation of tuberculosis, the hereditary predisposition is of any considerable importance or not.

The only and correct way is to begin with the investigation of a greater number of individuals or families — *consumptive and not consumptive* — and follow them through some *descendant* lines. One may go back in time several years, at least 10 or 20, and get to know the state of health in a larger number of families at that date. If on such an investigation one should come across

A.) a number of families, who at such a date, for instance in the year 1898, were afflicted with one or more cases of tuberculosis, and on the other hand

B.) a number of families, who were quite free from tuberculosis, then the point is to investigate how many cases of tuberculosis have occurred during the past ten years in the different classes of families, those who in 1898 were afflicted with tuberculosis and those who had no case of that disease to show up. The result will be still more reliable and correct, if the investigation goes to embrace not only one year but several years. It is also evident, that if the conclusions shall have any claim to a more general value, the investigation must needs be extended to a very large number of families.

I will try to illustrate this proceeding by an example. Supposing that out of 200 families examined in the year 1898 it had come out that the father or the mother in 100 families had been afflicted with tuberculosis, and that in the other 100 families no case of tuberculosis had occurred: then the point would be to investigate, whether cases of tuberculosis now had become much more numerous in the first class of families than in the other class. If it should turn out, that the number of cases of consumption during these 10 years had been almost the same in both classes of families, one must admit that it did not matter at all whether in the year 1898 it had occurred one or two cases of tuberculosis in some families or not — the risk for the descendants to catch tuberculosis proved to be the same for all; families who at first were free from tuberculosis had in the course of years been afflicted with the disease just as much as the other ones. In this way a real and rather

significant proof would be given to show, that the hereditary disposition is a matter of much subordinate importance.

The result might perhaps have been another: the tuberculosis was found constantly to appear much more numerously in the one class of families than in the other one. Such an observation should certainly not contradict but on the other hand by no means prove the existence of hereditary disposition in a proper sense, as the propagation of tuberculosis might just as well be accounted for as a matter of contagion in these families.

Researches of this kind have never been carried out at a larger scale, as far as I am aware. They ought, however, not to be quite infeasible, although requiring a most considerable lot of work and taking a very long time. For in order to attain fairly reliable results, one would have to count with very big numbers.

In the meantime another method for the solution of this problem is now to be drawn attention to. This method has been suggested by a Scandinavian Life Assurance Committee, of which I have been a member. The object of this Committee is to study the question of assuring not-normal risks and to suggest proper restrictions for such cases. At present the Committee is just engaged with the question of tubercular predisposition. In regard to the Life Assurance Companies the point of interest is, whether there is any more than average risk to assure the life of a person, about whom it is stated, for instance, that someone in his family, his father or his mother or some of his brothers or sisters, is or has been consumptive. If it be ascertained that such persons run a greater risk of catching consumption, then there is also a greater risk for such a person that he shall die within a certain period than for another one, who when applying for a life assurance is not aware of any case of consumption among his nearest relatives. Some Assurance Companies look upon "cases of consumption within the family" as a rather serious matter, and an applicant with such suspicious hereditary dispositions is either declined or has to pay an extra premium. Other companies are now-a-days perhaps not so anxious. Nobody has, however, a safe basis to build his opinion upon. One only supposes or believes it to be so or so. But the one part knows

just at little as the other part, whether the rate of mortality is really higher among the so-called "hereditarily charged" or not. The average mortality among all the life-assured in the Scandinavian countries is now-a-days fully well known. A special investigation of the mortality among those, who when applying for a life-assurance have stated themselves to be "hereditarily charged", has not yet been carried out by anybody or by any company. But that is just the sort of investigation, which must needs be performed. When the actual rates of the special mortality among those "hereditarily charged" have been found, a comparison can be made between that mortality and that of all the life-assured, whereby it may be ascertained not only whether the hereditary charg has any special effect, but also pretty exactly how far that effect works. It is such an investigation, which is intended to be arranged by "the Scandinavian Committee for an examination into the question of assuring not-normal risks".

In the course of this investigation it is the meaning to study not only the effect of hereditary disposition but also several other circumstances, which since long ago have been thought to make people liable to consumption, as for instance if they have previously, mostly in childhood, suffered from glandular or bone-tuberculosis, pleurisy, bronchitis etc., and especially the influence of a weakly constitution and bad nutrition.

Of course, the study of heredity is a most interesting study even in regard to childhood, but the available statistic material as to assured children is too insignificant to be used for any calculations whatever. The question concerning the influence of heredity upon tuberculosis in childhood has therefore to be left alone. The investigation of the Committee has only to deal with grown-up people, who are suspected to be affected with a predisposition to tuberculosis. It is just in the ages between 20 and 40 years, that most deaths of consumption occur. The etiology of tuberculosis is, therefore, of the utmost importance just for these ages, which are the most numerously represented among the life-assured. The material for statistical researches, which the total number of life-assured

places at our disposal, is thus likely to give us the most valuable information just as regards predisposition.

It should carry us too far to describe here in detail, in what manner such an investigation as aforesaid has to be carried out. That is for the Committee to do, when they are going to publish the result of their labour. I have but to confine myself to a few small indications.

In a certain number of Scandinavian companies all medical reports concerning people, who have applied for life-assurances since the starting of each company, will have to be perused. On special cards it is thereby to be noted down for each person assured everything that, according to a previously drawn-up plan, may be characterized as a sign of predisposition to tuberculosis, as for instance if father or mother died in tuberculosis, weakly constitution, certain previous diseases etc. The bringing together and systematization of all this material necessitates a considerable lot of work. Thanks to the plan made up by the Committee beforehand, this work is likely to be essentially facilitated. As soon as the material is systematized, the mathematical calculations are going to commence. It is hoped that the separate groups, into which the whole material will be divided, are sufficient to afford reliable mathematical conclusions. Then it will be found, what the mortality has been among tuberculously charged people of different ages and within the different classes. And we shall learn, whether the mortality is higher than the average one in such a class, where the applicants for assurance have stated that father died in tuberculosis, or among those who stated that mother died in tuberculosis, or among those who stated that both father and mother died in tuberculosis, or among those whose brothers and sisters died in the said disease, or among those who have suffered from pleurisy, or among those who in childhood have been affected with glandular or bone-tuberculosis etc. No doubt, the results will be highly interesting.

By way of experiment the Committee have tried their own method on the material at hand in one particular company. The number of tuberculously charged people, who have been assured in that company up to and including the year 1904, was found to

be no less than 8,022. But when duly classified the various figures seem to be too small to make the calculated results fully reliable. Still, out of this smaller material one can get an idea, how those figures shall appear, which finally crystallize out of such an investigation. A few examples from the report given by the Committee will suffice:

Class A1.

Father tuberculous.

Ages	Estimated mortality	Actual mortality
25—34	3.1	4
35—44	4.6	3
45—54	3	3
25—54	10.7	10

Class A2.

Mother tuberculous.

Ages	Estimated mortality	Actual mortality
25—34	4.7	8
35—44	5.8	5
45—54	3.9	5
25—54	14.4	18

Class B2.

Brothers or sisters tuberculous.

Ages	Estimated mortality	Actual mortality
25—34	2.1	—
35—44	3.3	5
45—54	3.1	2
55—60	1.5	1
25—60	10.0	8

Class D2.

Weakly constitution or thinness.

Ages	Estimated mortality	Actual mortality
25—34	2.1	30
35—44	2.4	17
45—54	2.9	11
55—60	1.3	3
25—60	8.7	61

The figures, on which these rates of mortality are based, have no doubt been too few to admit any reliable inferences, but, says the Committee, a few hints may still be ventured.

The hereditary and family circumstances, where they appear as sole agents, seem to have but a slight influence on mortality. Possibly a certain tendency to more than average mortality may be traced, when the mother has been tuberculous.

A weakly constitution or thinness, on the other hand, has quite an overwhelming influence, as will be seen from the enormous mortality in that class. Out of 78 deaths no fewer than 76 were caused by tuberculosis, although the resp. documents of application had given no occasion to remark any sign of tubercular disposition except weakness or thinness or both at a time.

The Scandinavian Committee, whose chairman is the general manager of the Thule Assurance Company of Stockholm, Mr. Sven Palme, may very likely have completed their great work on tuberculosis before next Congress of Tuberculosis.

The above paper is only meant to contain a few introductory remarks, dictated by the wish to suggest other countries to follow the example given from Sweden.

INVESTIGATION ON THE MORTALITY AMONGST THE ASSURED WITH THE LIFE ASSURANCE COMPANY THULE, STOCKHOLM, CHARGED WITH TUBERCULOSIS.*

In order to give a basis for a more comprehensive investigation on the influence on life assurance of tuberculosis the Life Assurance Company Thule lately has performed a preliminary special research, founded on the company's material, consisting of both granted policies and refusals. This research, on which some statements will be given below, is the first one in a series of investigations on the same subject, which is to comprise statistics from 15 Scandinavian life companies. The results of this extensive investigation probably may be expected within about three years.

At the beginning of the investigation now completed attention was given exclusively to the deaths. A form was elaborated for the notation of certain statements on the deaths, where some of the headings of the form might be applied. The appearance of the form is shown by the amendment.

By researching the mortuary papers the principle was followed that every death should be filed, where the *cause of death, heredity*

* In 1898 at a meeting with delegates of the life assurance companies in the four Scandinavian countries, held at Helsingfors, Finland, a committee was appointed with the purpose of investigating sub-standard lives. This committee, the president of which is Mr. Sven Palme, General Director of the Life Assurance Company Thule, Stockholm, Sweden, has performed and published several researches within various risk classes f. i. suicides and syphilitics, and is now preparing an extensive investigation on the tuberculosis. In order to clear out the lines along which the great investigation ought to be laid, it was agreed at another Scandinavian assurance meeting in Stockholm 1902 that a preliminary research should be performed on the statistics of the Thule. It is on this preliminary research the following account has been written. Stockholm, May 1908.

or family conditions, previous diseases or *status presens* indicated any tubercular moment.

The investigation of the deaths covered the period 1873—1902 and resulted in 461 filed deaths. However 116 of these deaths were of such nature that tuberculosis had been stated only in the *mortuary papers* as *cause of death*, whereas the *application papers* contained no moment, which might cause any statement in the other columns of the form.

However by measuring the influence on life assurance of tuberculosis it is evident that the facts stated in the application papers must be laid as a ground for an opinion, and from this reason those 116 cases were to be eliminated. Thus there remained a number of 345 deaths. Later on the list of deaths was completed by those occurred in the years 1903 and 1904, and the total thus amounted to 470.

Regarding the principles followed by the filing of the deaths a short account will be delivered below.

THE FOLLOWING CASES ARE FILED:

1) All cases, where the assured died from tuberculosis (irrespective of the nature or locality of the tubercular disease).

2) All cases, where the cause of death is stated to be another than tuberculosis, f. i. chronic heart disease, but where tuberculosis has appeared simultaneously. (Except such cases, where the cause of death is stated as *diabetes*, though tuberculosis has appeared simultaneously — of course only such cases not to be filed under 3) or 4)).

3) All cases, where the assured has shown either according to the *anamnesis* any symptom of tuberculosis or the medical examination has indicated any changes probably or certainly signifying tuberculosis (of the lungs).

4) All cases, where »tubercular charge» has been displayed in assured's family (familiarily or hereditarily).

Regarding the detailed arrangement of the statistics, see the amendment. As to the various headings a short explanation will be given.

The columns »Application No.» — »Cause of death», inclusive, need no special comments, only in respect of »Amount» it may be remarked that this column of course regards the policy amount and that it has been entered in the form in order to indicate the economical position of the assured.

Regarding the columns »heredity conditions» and »family conditions» it is considered that in these columns complete data regarding the relations of assured ought to be entered, as it is not satisfactory, of course, f. i. only to state in respect of brothers or sisters: »1 dead of tuberculosis», because there is a great difference if the assured has had only one brother or sister or if, except the dead one, there are 7—10 quite healthy brothers and sisters.

Regarding »Previous diseases» special columns have been entered for those organs, in which tuberculosis especially take its seat primarily. The column for »Other diseases» is meant to be used partly for tuberculosis being located in other organs, f. i. scrophular diseases in the eyes, partly for other nontubercular diseases, which may occur (f. i. syphilis a. o.).

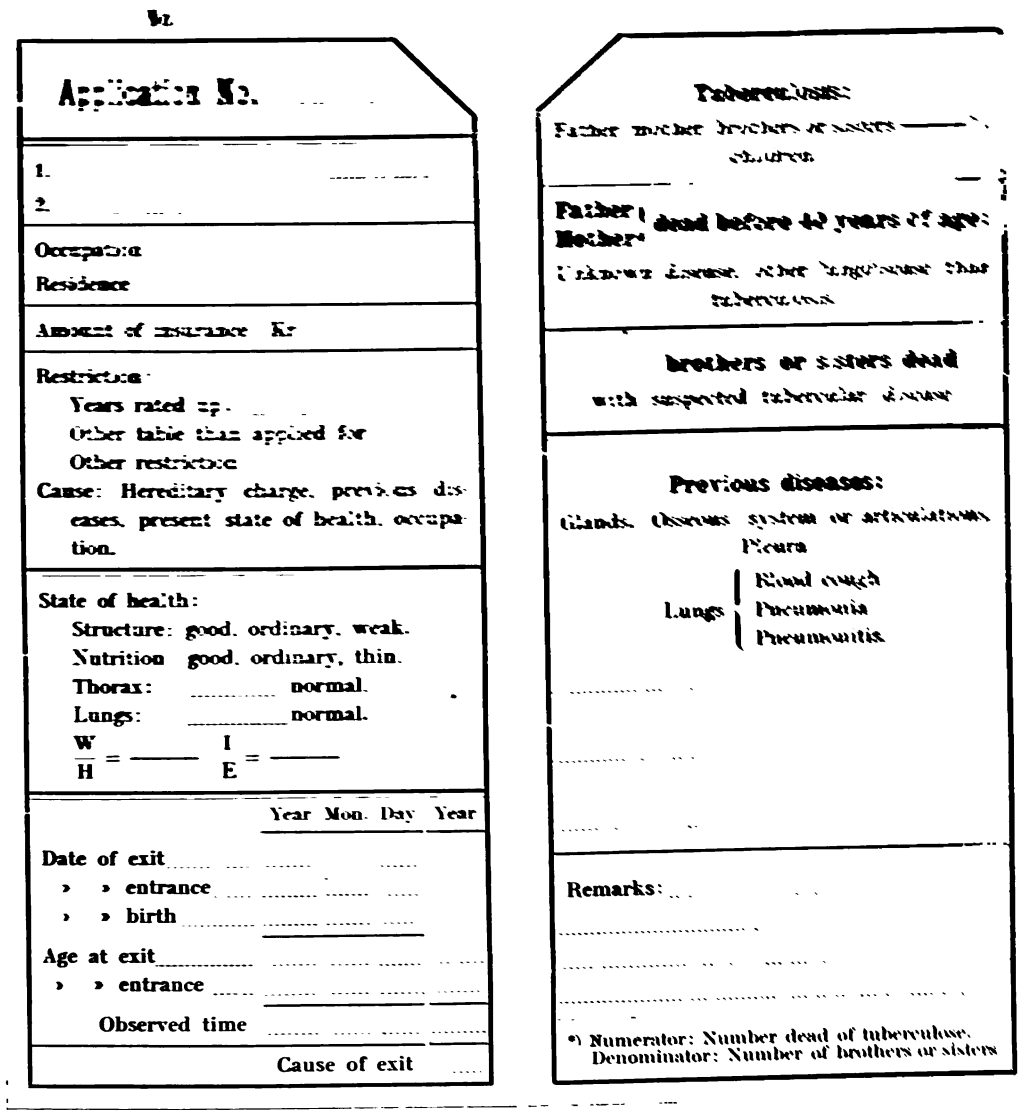
Regarding the columns »Anatomy», »General nutrition», »W» (width of stomach), »H» (Height), »$\frac{I}{E}$» (width of chest at deepest *inspiration* and *exspiration*) no special explanation is needed.

In the column »Thorax» is noted as »normal» every thorax regarding which no abnormity is stated.

In the column »Lungs» is noted what is remarked regarding the lungs, if namely that remark may be considered as connected with existing tuberculose or in any way be of some importance.

Finally are to be found the columns »Other organs» and »Remarks».

The deaths being dealt with in the way now described, all application papers of the Thule were examined from the beginning of the Company's business up to the end of 1904 and the documents concerned were removed according to the same principles as regarding the deaths. From the removed applications cards were later written as shown below.



Application No. ...

1. ...
2. ...

Occupation:
Residence

Amount of insurance Kr

Restriction:
Years rated up. ...
Other table than applied for
Other restriction:
Cause: Hereditary charge, previous diseases, present state of health, occupation.

State of health:
Structure: good, ordinary, weak.
Nutrition good, ordinary, thin.
Thorax: ..... normal.
Lungs: ..... normal.
W/H = ... I/E = ...

	Year	Mon.	Day	Year
Date of exit	...	...	...	...
» » entrance	...	...	...	...
» » birth	...	...	...	...
Age at exit	...	...	...	...
» » entrance	...	...	...	...
Observed time	...	...	...	...

Cause of exit ...

Tuberculosis:
Father mother brothers or sisters ..... children

Father / Mother dead before 40 years of age:

Unknown disease, other dangerous than tuberculosis

brothers or sisters dead with suspected tubercular disease

Previous diseases:
Glands. Osseous system or articulations
Pleura
Lungs: Blood cough, Pneumonia, Pneumonitis

.....
.....
.....

Remarks: ...
.....
.....
.....

*) Numerator: Number dead of tuberculose.
Denominator: Number of brothers or sisters

(White.)

The left figure is showing the front side of the card, the right one the back side.

The whole material included 8,022 observed lives, of which 470 deaths.

No. .....

Application No. .....

1. .....

2. .....

Occupation: .....

Residence: .....

Amount of insurance: Kr. .....

Restriction:
Years rated up: .....
Other table than applied for.
Other restriction: .....

Cause: Hereditary charge, previous diseases, present state of health, occupation.

State of health:
Structure: good, ordinary, weak.
Nutrition: good, ordinary, thin.
Thorax: ..... normal.
Lungs: ..... normal.
$\frac{W}{H} = \frac{\quad}{\quad}$ $\frac{I}{E} = \frac{\quad}{\quad}$

	Year	Mon.	Day	Year
Date of Death				
» » entrance				
» » birth				
Age at Death				
» » entrance				
Observed time				

Cause of Death .....

Tuberculosis:
Father, mother, brothers or sisters ——— *), children.

Father / Mother dead before 40 years of age:
Unknown disease, other lungdisease than tuberculosis.

..... **brothers or sisters dead** with suspected tubercular disease.

Previous diseases:
Glands, Osseous system or articulations, Pleura.
Lungs { Blood cough. / Pneumonia. / Pneumonitis.

.....
.....
.....
.....
.....
.....

Remarks: .....
.....
.....
.....

*) Numerator: Number dead of tuberculose.
Denominator: Number of brothers or sisters.

(Grey.)

As shown by the cards the material must be very heterogeneous. Except the observed clear cases, where only one of the moments indicated on the cards has been observed, a great number of combinations of two or more moments existed. A classification of

the material would, therefore, offer a great deal of difficulties, leaving out of sight that such a classification would give too small figures to yield a satisfying answer as to the mortality within each special group. However some of the most important cases were classified in special groups.

The original memorandum for the classification includes only *clear* cases, i. e. such cases, where only one of the moments specified on the cards is to be found. This memorandum looked as follows:

»MEMORANDUM

REGARDING THE INVESTIGATION ON THE MORTALITY OF THE ASSURED, CHARGED WITH TUBERCULOSIS, OF THE LIFE ASS. CO. THULE.

A. Parents:

1. Father has or has had tuberculosis or suspected tuberculosis.
2. Mother » » » » » » » »
1 + 2 have » have » » » » »

B. Brothers or sisters:

1. One has or has had tuberculosis or suspected tuberculosis.
2. 2 or more have or have had tuberculosis or suspected tuberculosis.

C. Father and **mother** or one of them **dead** before 40 years of age.

D. Previous diseases.

1. Blood cough.
2. Pneumonitis.
3. Pleuritis.
4. Glands.
5. Tuberculosis in osseous system or articulations.

E. 1. **Occupation.**
2. **Amount** under Kr. 3,000.
3. » of » 3,000 or more.

F. Present state of health:

1. Lungs not normal.
2. Meagreness or weak anatomy.
3. Width of chest in proportion to height.»

At the investigation of the Thule statistics it has been found necessary to make the classification below in order to show in which degree the various moments of the material are represented. Except the absolutely clear cases this classification also includes a few combinations of two moments.

THE CONSISTENCY OF THE MATERIAL.

	Number cases.	Of which dead.
A. Tuberculosis with parents.		
1. Father	272	11
2. Mother	359	21
3. Father and mother	10	1
B. Tuberculosis with brothers and sisters.		
1. 1 brother or sister	1,191	53
2. 2 or more brothers and sisters	197	10
C. Previous diseases.		
1. Diseases on account of which tuberculosis or disposition for tuberculosis may be suspected*)	589	35
2. Pneumonia	2,013	42
D. Present state of health.		
1. Lungs not normal	27	1
2. Weak anatomy or meagreness	154	78
E. Combinations.		
1. Hereditary disposition + C_1	114	11
2. » » + D_1	11	—
3. » » + D_2	391	34
4. C_1 + D	214	18
F. Other cases not specified	2,480	155
Total	8,022	470

*) Specification:

Pleuritis	234	5
Blood cough	67	8
Pneumonitis	201	14
Tuberculosis in osseous syst. or artic.	31	2
Glands	36	4

The fact that the number of deaths amongst the pleuritis cases is very small may depend upon this disease's very seldom appearing without any complication.

The clear pneumonia cases constitute a special class. As will be seen this class is not included in the first mentioned Memorandum, because this affection cannot be suspected to indicate any moment of tuberculosis. As, however, this class is constituting a good deal of the material, also this class has been investigated.

* * *

It is quite evident that the figures above given are too small to afford any certain measures on the mortality observed. From this reason it has been found necessary only to make a comparison between the expected and the actual deaths in order to learn if, in any case, an over average mortality could be traced.

To deduce the expected mortality was used a table of mortality founded on the experience of the Thule 1873—1897. This table is giving only the mortality for the ages 25—60 years, but the material outside of these limit ages was so very small that it offered no interest.

The comparison between the expected and the actual mortality, therefore, only comprises the ages 25—60 years. In the cases where no death has occurred above the age of 54, the investigation has not exceeded that age. The table showing the consistency of the material immediately proves that some of the groups are so small that they cannot be dealt with mathematically. This is especially the case with the groups A_3, D_1, E_2. Through a comparison between the number observed cases and the corresponding number deaths further will be noted as especially remarkable partly the very low mortality amongst the clear cases of pneumonia, partly the remarkably high mortality of the group D_2, i. e. amongst the weak and meagre subjects. The facts here noted will be further explained by the comparing tables below given.

COMPARISON BETWEEN THE EXPECTED AND THE ACTUAL MORTALITY.

Group A_1.

FATHER TUBERCULOSIS.

Group of ages	Expected mortality	Actual mortality
25—34	3.1	4
35—44	4.6	3
45—54	3.0	3
25—54	10.7	10

Group A_2.

MOTHER TUBERCULOSIS.

Group of ages	Expected mortality	Actual mortality
25—34	4.7	8
35—44	5.8	5
45—54	3.9	5
25—54	14.4	18

Group B_1.

ONE BROTHER OR SISTER TUBERCULOSIS.

Group of ages	Expected mortality	Actual mortality
25—34	13.1	13
35—44	19.4	17
45—54	15.7	11
55—60	5.7	6
25—60	53.9	47

Group B_2.

TWO OR MORE BROTHERS OR SISTERS TUBERCULOSIS.

Group of ages	Expected mortality	Actual mortality
25—34	2.1	—
35—44	3.3	5
45—54	3.1	2
55—60	1.5	1
25—60	10	8

Group C_1.

PREVIOUS DISEASES SUSPECTED TO BE OF TUBERCULAR NATURE.

Group of ages	Expected mortality	Actual mortality
25—34	6.4	6
35—44	12.0	9
45—54	10.8	5
55—60	4.0	5
25—60	32.7	25

Group C_2.

PNEUMONIA.

Group of ages	Expected mortality	Actual mortality
25—34	21.8	8
35—44	34.4	14
45—54	31.6	8
55—60	9.9	6
25—60	97.7	36

Group D_2.
WEAK ANATOMY OR MEAGRENESS.

Group of ages	Expected mortality	Actual mortality
25—34	2.1	30
35—44	2.4	17
45—54	2.9	11
55—60	1.3	3
25—60	8.7	61

Group E_1.
HEREDITARY DISPOSITION AND PREVIOUS DISEASES SUSPECTED TO BE OF TUBERCULAR NATURE.

Group of ages	Expected mortality	Actual mortality
25—34	1.4	4
35—44	1.8	1
45—54	2.0	—
55—60	0.9	1
25—60	6.1	6

Group E_3.
HEREDITARY DISPOSITION AND WEAK ANATOMY OR MEAGRENESS.

Group of ages	Expected mortality	Actual mortality
25—34	5.0	7
35—44	6.4	13
45—54	4.1	10
55—60	0.9	1
25—60	16.4	31

Group E_4.
PREVIOUS DISEASES SUSPECTED TO BE OF TUBERCULAR NATURE OR WEAK ANATOMY OR MEAGRENESS.

Group of ages	Expected mortality	Actual mortality
25—34	2.6	7
45—44	4.2	2
45—54	3.6	5
55—60	0.9	1
25—60	11.3	15

Now if the question is made: May any conclusions on the influence on life assurance of tuberculosis be footed on the above tables, the answer mainly is negative — on account of the small figures which are at hand. Yet the result is giving some intimations, which it may be allowed to point out.

1:o. The hereditary and family conditions seem not, when appearing as single moment, to have any essential influence on the mortality. Possibly a tendency to increase of the mortality above the average may be traced when mother has had tuberculosis.

2:o. At pneumonia without any other complication a remarkable under average mortality appears, which is indicating that this group does not represent any especially dangerous moment as life assurance risk.

3:o. Weak anatomy or meagreness on the contrary prove to be very hazardous as is shown by the very high over average mortality within this group. Of 78 observed cases tuberculosis was the cause of death in not less than 76 cases, notwithstanding the fact that the application papers had not caused any notation of any moment under the heading of the cards, except weak, meagre or both and, possibly, some infavorable relation between $\frac{W}{H}$ and $\frac{I}{E}$.

As has formerly been accentuated the object of this investigation has been only preliminary, namely to prepare a general investigation with a material gathered from the experience of several assurance companies. When such a material is complete, also the more complicated cases under the heading F in the table over the consistency of the material will be dealt with.

On the first side of this account was mentioned that the investigation of the Thule material included both granted policies and refusals. It ought, therefore, to be added regarding the last mentioned part of the material, that the number of persons having got their applications declined and regarding whom complete information was obtained amounted to 1,014, of whom 101 were dead. Only regarding 30 persons it has not yet been possible to get satisfactory information. This result has been possible only through the Swedish parish registrary, which facilitates the tracing of a person in every parish, where he has lived.

However, the number of observed cases is too small to make possible any classification of the material. To give an idea of the mortality within this group as a whole it may be sufficient to show the mortality in groups of ages, each including 10 years.

DECLINED

ON ACCOUNT OF A TUBERCULAR OR SUSPECTED TUBERCULAR MOMENT.

Age	Observed years	Number dead	Mortality
20	162	3	0.01852
20—30	2,077	19	0.00915
30—40	3,685	40	0.01085
40—50	2,417	24	0.00993
50—60	990	12	0.01212
60—70	256	3	0.01172
70—80	24	—	—
80—	3	—	—
Total	9,614	101	—

In spite of the small definite results of the now completed investigation it yet may be of some use for other researches, f. i. with a social aim, on account of the indications above given. This is the reason too why it has been brought before the congress.

diseases in			Other diseases	Status præsens								Remarks
Articulations	Pleura	Lungs		Anatomy	General Nutrition	Width of stomach	H	$\frac{I}{E}$	Thorax	Lungs	Other organs	

(Back side of card.)

Applic. No.	Occupation	Nation	Date of				Conditions		Amount	Dead		Cause of death	Heredity conditions		Family conditions		Previous	
			Birth		Entrance		Normal Refusal	Rated up					Ascending line	Byline	Brothers and sisters	Children (Wife)	Glands	Osseous system
			Year	Day	Year	Day				Year	Day							

(Front side of card.)

THE FREQUENCY OF TUBERCULOSIS OF THE LUNGS IN DIFFERENT PARTS OF STOCKHOLM IN THE YEAR 1906, COMPARED WITH THE POPULATIONS' DENSITY AND ECONOMICAL POSITION.

BY

J. E. JOHANSSON M. D. AND R. MOOSBERG B. A.

DURING the months of February to April 1906 an enquête was arranged regarding the frequency of consumption in Sweden. A report of the result dealing with *the entire country* was prepared for the Sixth International Tuberculosis Conference in Vienna 1907. The results as regards *Stockholm* were of special interest because it was possible to compare them with the number of residences the counting of which was carried out in the beginning of 1906.

The enquête was arranged in the following manner. All medical men in practise were requested to give particulars, on forms printed for the purpose, of every case of tuberculosis coming under their care during the above mentioned period. The forms contained the patients' name, age, position, trade or profession, residence, economical position, besides which information was supplied as to whether the patient could stay at home, or ought to be admitted to a sanatorium or asylum.

Altogether 2,270 cases of consumption came under observation in Stockholm. Of this number 2,162, on account of the information given regarding their addresses, could be divided among the 26 wards of the town; 817 were considered to be in need of sanatorium treatment, that is to say, they were in an early stage of the

disease. The rumber of advanced cases, which on account of the danger of infecting those around them, could not be nursed at home amounted to 1003. With reference to their economical position 1,711 were registred as poor, that is to say, without means enablng them to contribute themselves towards the cost of receiving proper care.

TABLE. I.

Parish	Ward	Cases of consumption under observation	„Sanatorium care"	Cases in need of other care	„Poor"	Number of inhabitants	Number of cases of consumption pr 1000 inhabitants
Nikolai	I	97	28	57	82	10.404	9.32
Klara.....	II	40	17	15	31	6.697	5.97
»	III	71	26	37	51	8.441	8.41
Kungsholms...	IV	69	25	30	47	9.818	7.03
»	XVII	88	32	37	73	13.704	6.42
»	XXIII	118	43	49	100	15.073	7.83
Adolf Fredriks.....	V	77	35	25	48	11.230	6.86
»	VI	119	40	54	88	12.421	9.58
»	XVIII	115	39	44	78	15.334	7.50
»	XXII	82	28	33	54	10.703	7.66
»	XXVI	64	26	28	48	9.012	7.10
Jakobs	VII	54	25	20	32	11.492	4.70
Johannes	VIII	59	26	21	42	9.189	6.42
»	XXI	94	36	50	87	13.918	6.75
Hedvig Eleonora.. ...	IX	88	34	24	51	16.971	5.19
»	X	82	38	25	51	12.707	6.45
»	XI	56	20	19	35	12.109	4.62
»	XX	39	13	12	25	12.517	3.12
»	XXIV	67	26	23	44	11.623	5.76
Katarina	XII	91	32	46	76	11.900	7.65
»	XIII	99	37	49	80	11.194	8.84
»	XIV	156	56	68	132	14.075	11.08
»	XXV	94	34	51	81	10.152	9.26
Maria.....	XV	95	37	43	65	14.643	6.49
»	XVI	89	30	49	76	16.519	5.39
»	XIX	59	14	34	44	10.252	5.76
no address given		108	20	60	90	12.350	
Total		2.270	817	1.003	1.711	324.448	7.27

Table 1 shows at a glance the division of the cases under observation in accordance with the plan given above. Column 1 gives the names of the different parishes, col. 2 the numbers of the wards, col. 3 the total number of cases observed within each ward, col. 4 number of sanatorium cases, col. 5 those in need of

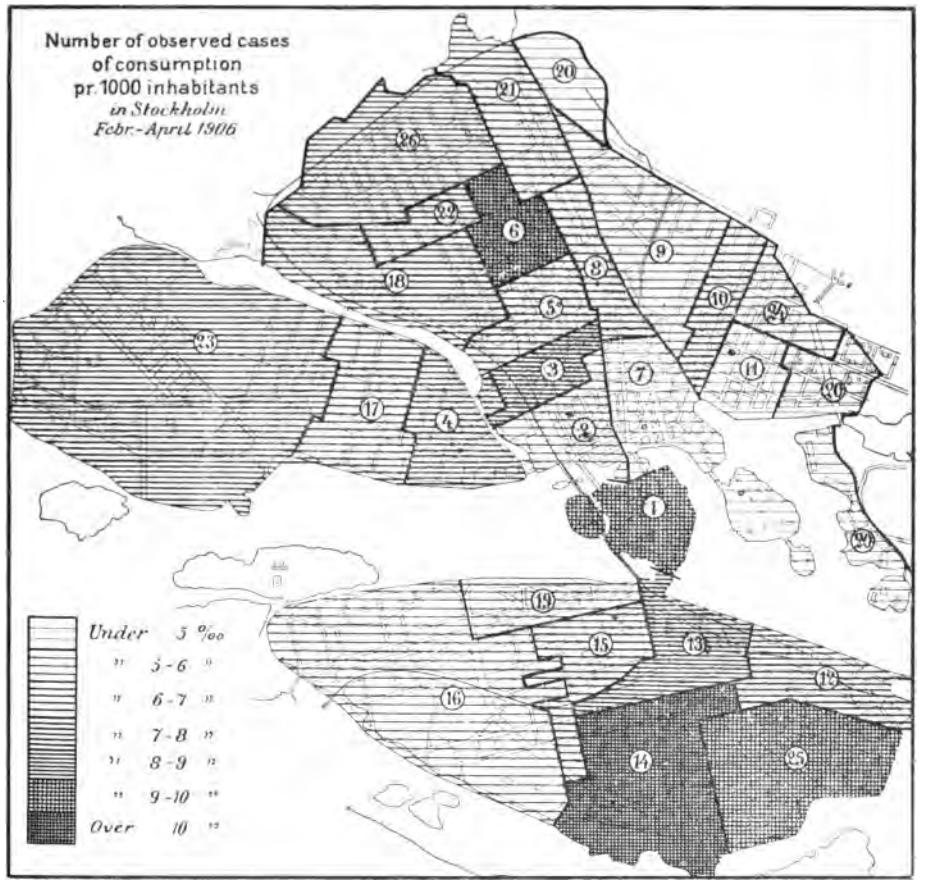


Plate I.

care in some other establishment, col. 6 the poor, col. 7 the population of the wards, col. 8 the frequency of tuberculosis that is to say, the number of cases per 1,000 inhabitants in each of the wards.

Plate 1 gives a graphic account of *the spread of tuberculosis of the lungs* in the different parts of the town, repeated here on

account of the figures given in table 1 column 8 regarding the frequency of consumption. Similar graphic reports upon the density of the population and also of the amount of house-rents in the different wards will be found in plates II and III. The *density of the population* is given by the number of inhabitants per fireplace (room and kitchen). The same is the case with the *house-rents.*

A glance at these plates shows that the frequency of consumption varies practically in the same way as the density of the population but just inversely to the amount of the house-rents. *Consumption is most frequent in those parts of the town where the rents are lowest and the population densest.*

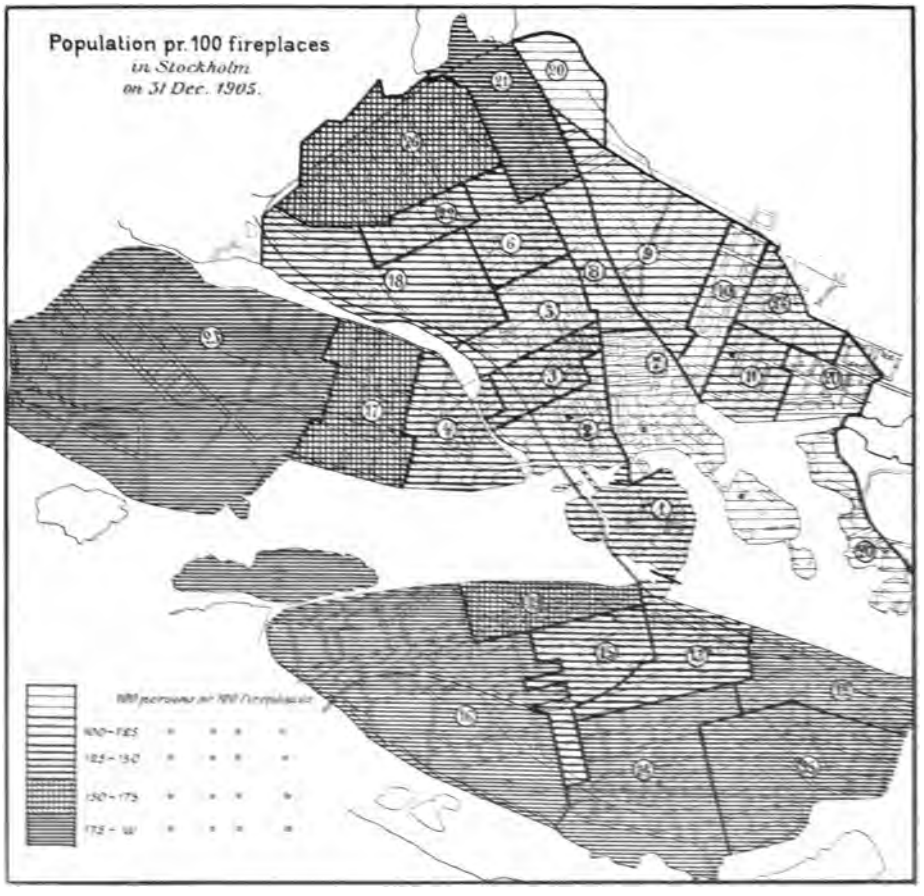


Plate II.

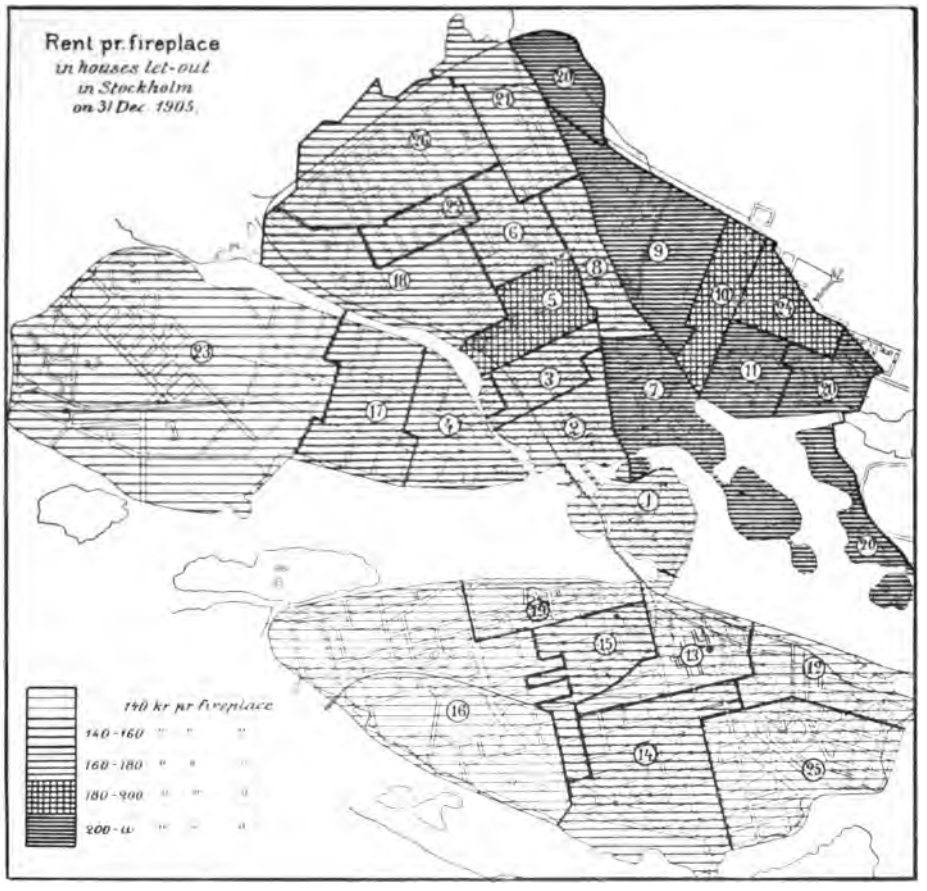


Plate III.

In table 2 the wards are arranged according to the frequency of consumption. In each group the average frequency of the disease has been reckoned, the number of inhabitants per 100 fireplaces, the amount of house-rent per fireplace, and also the percentage of the different groups "poor", "sanatorium cases" and "cases in need of other hospital care" among the total cases of tuberculosis the lungs which have been under observation.

We find that *the amount of house-rent per fireplace regularly decreases with the increase of the frequency of consumption and that the percentage of "poor" among the cases observed rises with the same regularity.*

TABLE 2.

Cases of tuberculosis in lungs per 1,000 inhabitants.

	under 5.0	5.0—6.0	6.0—7.0	7.0—8.0	8.0—9.0	9.0—10.0	over 10.0
Wards	VII, XI, XX	II, IX, XVI, XIX, XXIV	V, VIII, X, XV, XVII, XXI	IV, XII, XVIII, XXII, XXIII, XXVI	III, XIII,	I. VI, XXV	XIV
Frequency of consumption	4.1 %	5.5 %	6.6 %	7.5 %	8.7 %	9.4 %	11.1 %
Number of inhabitants per 100 fireplaces	111	129	132	163	122	147	176
Amount of rent per 100 do. Kr....	210	179	173	161	157	147	141
A percentage of total cases of consumption gives following figures:							
"Poor„	61.7 %	71.7 %	73.9 %	74.8 %	77.1 %	81.0 %	84.6 %
"Sanatoria cases„	38.9 %	35.3 %	41.2 %	35.8 %	37.1 %	32.9 %	35.9 %
„Cases in need of other hospital care"	34.2 %	42.3 %	40.6 %	42.7 %	50.6 %	52.3 %	43.6 %

The number of inhabitants pr 100 fireplaces grows with the frequency of consumption. The two groups which include wards III and XIII as also I, VI and XXV make, however, an exception. But just these wards are conspicuous for a very high percentage af advanced cases which the doctors have considered ought not to be treated at home, namely the group „cases in need of other hospital care").

The group „sanatorium cases" among the number of cases under obsersation is conspicuous for its comparatively insignificant variation which does not show any irregularity. *A priori* one could expect the precentage of cases in the early stage of the disease to be the same, independent of the fact as to whether the disease was widely spread or not.

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